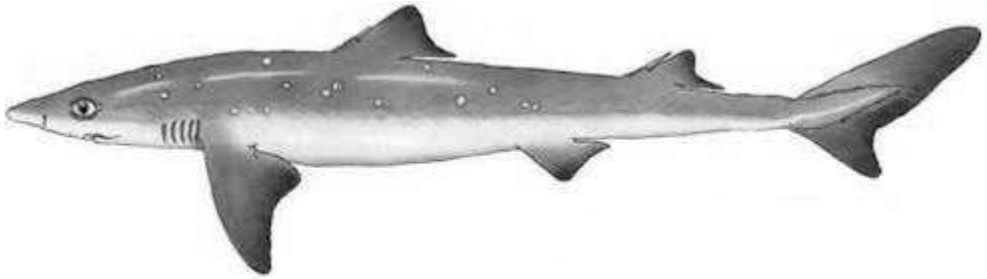
Amendment 3
to the
Spiny Dogfish
Fishery Management Plan

Includes Environmental Assessment (EA)



March 18, 2014

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in cooperation with the

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1.0 EXECUTIVE SUMMARY

Pursuant to the Magnuson Stevens Fishery Conservation and Management Act of 1976 (MSA) as amended, the Northwest Atlantic stock of spiny dogfish (*Squalus acanthias*) is jointly managed by the Mid-Atlantic (MAFMC) and New England Fishery Management Councils (NEFMC; Councils) through the Federal Spiny Dogfish Fishery Management Plan (FMP).

This amendment document was prepared by the Mid-Atlantic Fishery Management Council under consultation with the National Marine Fisheries Service (NMFS). The document presents a range of alternatives for amending the FMP along with a characterization of the environmental impacts of each of those alternatives. The alternatives consist of modifications to the FMP that are needed to maintain consistency with the MSA regarding essential fish habitat (EFH). Amendment 3 will also address other issues that relate to more efficiently achieving the established management goals of the FMP. This document was developed in accordance with a number of applicable laws and statutes that are described in Section 8.0 (see the Table of Contents to locate document sections).

A comparison of the action alternatives relative to "no action" is a requirement under the implementation of the National Environmental Policy Act (NEPA), however in terms of the review of EFH for spiny dogfish "no action" would be inconsistent with the MSA. Therefore, "no action" under EFH in this amendment is actually a status quo or baseline alternative that would maintain existing EFH definitions with the FMP.

Management Actions: Four suites of management actions are contemplated in this amendment (each of which includes a set of alternatives). The actions and alternatives are listed below with the Councils' **preferred alternatives noted in bold font**. In all cases, the two Councils were in agreement in the selection of preferred alternatives:

1 Research Set-Aside (RSA)

Problem statement: In 2001, all of the Council's FMPs were adjusted to allow for the set-aside of annual quota to support research and data collection. At the time the adjustment was developed, the Spiny Dogfish FMP was in development and was left out of that process. Thus the existing FMP does not allow for the benefits associated with the RSA program.

Alternatives:
1A: No action (no RSAs)
1B: (Preferred) Allow allocation of up to 3% of commercial quota as RSA
1C: Allow allocation of up to 5% of commercial quota as RSA

Council recommendation: The Councils chose **Alternative 1B** in order to include the spiny dogfish fishery in the RSA program (reflecting a preference to move away from the status quo, i.e., Alternative 1A) and because the 3% allocation is consistent with the percentages allowed for other MAFMC-managed fisheries. The 5% allocation amount which would be allowed under Alternative 1C was considered by the Councils to be excessive.

Impact analysis: All pertinent impacts to the human environment of harvesting annual quotas are analyzed in the specification package submitted to NMFS each year. The set-aside will always be deducted from and not in addition to the Total Allowable Landings that is specified.

Hence the impacts resulting from the harvest of set-aside quantities will always be fully accounted for. Moreover, if a research project requests an exemption from an existing fisheries regulation, an analysis must be prepared which analyzes the impact of that exemption.

2 Essential Fish Habitat (EFH) Definitions for all Life Stages of Spiny Dogfish:

Problem statement: In order for the plan to be fully compliant with the MSA, the EFH definitions must be reviewed every five years, and if necessary, updated. A review of the EFH definitions will be included in this amendment to keep the FMP compliant with the MSA. An optional update to the EFH designations (Alt 2B) would base them on data from a more recent time period and define EFH for five size and sex-specific life history stages with distinct spatial distributions in the Northeast region, replacing status quo designations for two life history stages that only differentiate EFH by size.

Alternatives: 2A: No action (Review but do not update EFH definitions)
2B: (Preferred) Update EFH definitions as needed

Council recommendation: : The Councils chose Alternative 2B as their preferred alternative in order to bring the FMP into compliance with the MSA and improve the quality and utility of the designations.

Impact analysis: To the degree that spiny dogfish EFH is adversely affected by fishing and/or non-fishing activities, management oversight of these activities in areas designated as EFH for a given life stage could directly or indirectly benefit the resource. Alternative 2B identifies EFH for all life stages of spiny dogfish based upon updated data from a range of fishery independent sampling programs. By updating and improving the EFH designations, future impacts to EFH for spiny dogfish can be identified and mitigated. The areas under consideration as EFH under the action alternative overlap with areas already designated as EFH for other species.

The MSA also requires that other EFH components of the FMP that were originally described in 1999 be up-dated as well. To comply with this requirement, this amendment includes a revised evaluation of the potential effects of the dogfish fishery on EFH for all federally-managed species in the region as well as any effects of other MSA fisheries on dogfish EFH. Other items include up-dated information on the principal prey species consumed by spiny dogfish and an evaluation of the effects of non-fishing activities on dogfish EFH.

3 Delayed Implementation of Commercial Quota at Start of New Fishing Year

Problem statement: Under the current FMP, if the effective date for the final rule for specifications is delayed beyond the start of the new fishing year (May 1), the previous year's daily possession limit is maintained in the regulations; however, the fishery operates without a commercial quota. In order to correct this, the FMP can be changed to keep in place all of the previous fishing year's management measures, including the quota, until they are replaced via rulemaking.

Alternatives: 3A: No action
3B: (Preferred) Maintain Previous Year Quota until Effective Date for New Quota

Council recommendation: The Councils chose **Alternative 3B** as their preferred alternative in order to close this administrative loophole and be consistent among Council-managed FMPs.

Impact analysis: This is a purely administrative action that is not associated with any impacts to the human environment.

4 Commercial Quota Allocation Scheme

Problem statement: There are numerous problems that exist in the absence of a Joint Council and Commission FMP for spiny dogfish. One of these is confusion and the potential for inadvertent possession violations that occurs when waters under the different jurisdictions are open / closed at different times. This is largely due to a mismatch in the way the annual quota is allocated. Under the Commission plan, the quota is geographically allocated, while under the federal plan, the quota is seasonally allocated. The federal FMP can be amended to minimize disruption of fishing operations that occur in both federal and state waters.

Alternatives:
4A: No action (Maintain existing two-period seasonal allocation scheme)
4B: (Preferred) Eliminate Allocation of Commercial Quota
4C: Establish Geographic Allocation of the Commercial Quota Identical to that Currently In Place under the ASMFC Plan

Council recommendation: The Councils chose **Alternative 4B** as their preferred alternative because it was perceived as the alternative that was the least disruptive to fishery operations that were subject to management measures established under both the federal and interstate FMPs.

Impact analysis: The impacts of the action alternatives under this issue are primarily socio-economic and positive in that eliminating the potential conflicts in the allocation schemes would benefit participants in the respective fisheries. Pertinent impacts to the human environment are accounted for in setting the annual quota and are not expected to change since any such change would likely be tied to a shift in the geographic distribution of fishing effort which is not expected. The action alternatives would achieve the same outcome except that if Alternative 4C is adopted and further modification to the Interstate FMP occurs, the plans would again be inconsistent.

Table 1. Qualitative summary of the expected impacts of various alternatives considered for Amendment 3. A minus sign (-) signifies an expected negative impact, a plus sign (+) a positive impact, and zero indicates a null impact. Brackets are used to convey a minor effect, such as slight positive [+].

Issue	Alternatives	Managed Resource	Non-Target Species	EFH	Protected Resources	Economic	Social
Research Set-Aside	**Alt. 1a No Action**	0	0	0	0	0	0
	Alt. 1b* 3% RSA	[+]	[+]	[+]	[+]	[+]	[+]
	Alt. 1c 5% RSA	[+]	[+]	[+]	[+]	[+]	[+]
Essential Fish Habitat	**Alt. 2a No Action**	[+]	[+]	+	[+]	[+]	[+]
	Alt. 2b* Update EFH	[+]	[+]	+	[+]	[+]	[+]
Delayed Implementation of Commercial Quota	**Alt. 3a No Action**	[-]	[-]	0	0	0	0
	Alt. 3b* Maintain Previous Year Measures	[+]	[+]	0	0	0	0
Commercial Quota Allocation	**Alt. 4a No Action**	0	0	0	0	[-]	-
	Alt. 4b* No Allocation	0	0	0	0	0	[+]
	Alt. 4c Match ISFMP	0	0	0	0	0	[+]

* Preferred Alternatives

Cumulative Impacts

When the proposed actions are considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, they are not expected to result in any *significant* impacts, positive or negative; therefore, there are no significant cumulative effects associated with the action proposed in this document (see section 7.5).

Conclusions

A detailed discussion of the environmental impacts of the alternatives, as well as any cumulative impacts, considered in this specifications document are provided in section 7.0. The action alternatives are not associated with significant impacts to the managed resource and non-target species, physical, social or economic environment individually or in conjunction with other actions under NEPA; therefore, a "Finding of No Significant Impact" is determined.

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2.0 LIST OF ACRONYMS

ABC	Annual Biological Catch
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
ASAP	Age Structured Assessment Program
ASMFC	Atlantic States Marine Fisheries Commission
CEA	Cumulative Effects Assessment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CZMA	Coastal Zone Management Act
DPS	Distinct Population Segment
DPSWG	Data Poor Stocks Working Group
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFP	Exempted Fishing Permit
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act of 1973
F	Fishing Mortality Rate
FR	Federal Register
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
HPTRP	Harbor Porpoise Take Reduction Plan
IRFA	Initial Regulatory Flexibility Analysis
LNG	Liquefied Natural Gas
LOF	List of Fisheries
LWTRP	Large Whale Take Reduction Plan
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistical Survey
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
NAO	NOAA Administrative Order
NEFSC	Northeast Fisheries Science Center
NEFOP	Northeast Fisheries Observer Program
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Limit
OY	Optimal Yield
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
RSA	Research Set-Aside
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SFA	Sustainable Fisheries Act
SBA	Small Business Administration
SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
TED	Turtle Excluder Device
US	United States
VECs	Valued Ecosystem Components
VTR	Vessel Trip Report

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4.0 INTRODUCTION AND BACKGROUND

4.1 Purpose and Need for the Actions

The purpose of this action is to consider alternatives for amending the fishery management plan (FMP) for the U.S. Atlantic spiny dogfish fishery. Specifically, the purpose is to consider research set-aside (RSA), updating essential fish habitat (EFH) using the latest data, rolling previous year's quota into the new fishing year and whether the current quota allocation scheme is still adequate. This action is needed to promote research, incorporate new science for EFH, and improve the commercial quota setting process in order to achieve optimum yield from the resource in the western Atlantic Ocean.

5.0 ALTERNATIVES

There are four management issues, each with its own set of alternatives under consideration in this document. An analysis of "no action" (i.e., Alternatives 1a, 2a, 3a, and 4a) is a requirement under the implementation of NEPA. "No action", with regard to a review of spiny dogfish EFH definitions (Alternative 2a) would be inconsistent with the MSA. Therefore, for the purposes of this document, "no action" under EFH is actually a status quo or baseline alternative that would extend the existing EFH definitions following the required EFH review.

5.1 ALLOWANCE FOR RESEARCH SET-ASIDE (RSA)

Alternative 1A: No Action. (No RSA)
Under this alternative, the specification of management measures for spiny dogfish would continue without an option for the set-aside of commercial quota for research purposes.

For the two action alternatives under this issue, the current procedure followed by the Council and NMFS Northeast Regional Office (NERO) for specifying RSA would be followed. The difference between the two alternatives lies only in the maximum set-aside percentages allowed. Under either of the action alternatives, the FMP would identify an upper limit (either 3% or 5% of the annual spiny dogfish commercial quota) on the total research set-aside amount allowed in a given fishing year. Specification of RSA would be incorporated into the Council's quota specification package submitted to NMFS and the current procedure for requesting research proposals and approval of proposals would be followed.

Alternative 1B (Preferred): Allowance for Allocation of up to 3% of Commercial Quota as RSA.
Under this alternative, the specification of management measures for spiny dogfish would include an option for the set-aside of up to 3% of the commercial quota for research purposes. The Councils chose **Alternative 1B** in order to include the spiny dogfish fishery in the RSA program (reflecting a preference to move away from the status quo, i.e., Alternative 1A) and because the 3% allocation is consistent with the percentages allowed for other MAFMC-managed fisheries. The 5% allocation amount which would be allowed under Alternative 1C (below) was considered by the Councils to be excessive.

Alternative 1C: Allowance for Allocation of up to 5% of Commercial Quota as RSA
Under this alternative, the specification of management measures for spiny dogfish would include an option for the set-aside of up to 5% of the commercial quota for research purposes.

5.2 ESSENTIAL FISH HABITAT (EFH) DEFINITIONS FOR ALL LIFE STAGES OF SPINY DOGFISH

The Spiny Dogfish FMP is overdue for review and update of its EFH designations. EFH designations are used by NMFS when consulting with other agencies on federal activities, and up-to-date designations lead to more effective consultation and therefore more effective protection of EFH. The alternatives to update EFH designations meet NMFS implementing regulations for MSA's EFH provisions. The methodology was developed cooperatively by the MAFMC, NEFSC and GARFO Habitat Conservation Division and is based on the best available scientific information. See 5.2.3 below for details.

Alternative Set 2 considers options to update the textual descriptions and geographical identifications of EFH for all life stages of spiny dogfish. Section 600.815(a)(9) of the final rule to revise the regulations implementing the EFH provisions of the MSA (the "EFH Final Rule") states that Councils should conduct such reviews as recommended by the Secretary, but at least once every five years. Thus, the Council considered in Alternative Set 2 alternatives for identifying and describing EFH for individual life stages of spiny dogfish. The major differences between Alternatives 2A and 2B are the use of updated information and data sources, the use of nearshore surveys, and the consideration of separate size and sex-specific life stages for spiny dogfish. If the status quo depiction is maintained (Alternative 2A), the differential distribution of males and females would not be taken into account. This is important because the directed fishery for spiny dogfish has historically targeted a single sex-specific life stage - adult females. Additionally, constraint in the productivity of the stock/fishery was observed when the abundance of spiny dogfish recruits was depressed for several years (1997 -2003). If areas and text descriptions that represent size and sex-specific life stages are selected, the EFH designations can be more effectively applied in future EFH consultations that would minimize the potential impacts of fishing and non-fishing activities on EFH for this species.

5.2.1 EFH Designation Methods

5.2.1.1 Status Quo Designations

North of Cape Hatteras, the status quo EFH maps consist of 90% of the ranked ten-minute squares where spring and fall NEFSC trawl survey catches of spiny dogfish occurred during 1963-1996[1]. The status quo designations also include the "seawater" (salinities >25 ppt) portions of inshore estuaries and embayments north of Cape Cod where juvenile and adult spiny dogfish were identified as common or abundant by the NOAA Estuarine Living Marine Resource (ELMR) Program (Jury et al. 1994)[2]. With the exception of a personal communication from the Massachusetts Division of Marine Fisheries, no additional information was included in the status quo EFH designations. No survey data were available for the area

[1] Ten minute squares were ranked from high to low according to average catch rates over the time series after individual tow data (numbers per tow) were transformed logarithmically.
[2] Because spiny dogfish were not included in the ELMR reports for the Mid-Atlantic and South Atlantic regions and none of the states except Massachusetts submitted any comments on the proposed EFH designations, there are no status quo designations in inshore waters between Cape Hatteras and Cape Cod.

south of Cape Hatteras, but since this species ranges as far south as Florida, the status quo EFH map for juvenile and adult spiny dogfish extends over the entire continental shelf from Cape Hatteras to Cape Canaveral. Depth and temperature ranges that generally exist within the geographic range of EFH defined in the status quo EFH text descriptions.

5.2.1.2 Revised Designations

Available data for the revised EFH maps were drawn from the NEFSC trawl survey, the coastal NEAMAP trawl survey, and state surveys from Maine, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, and Virgina (Table 2). In the NEFSC, MADMF and MEDMR surveys, male and female dogfish are differentiated[3]. Other surveys do not differentiate spiny dogfish by sex and in those cases only size information was used. ELMR information for the inshore estuaries and embayments – which is only available for the Gulf of Maine and does not differentiate the sex and size-specific life stages used in the revised EFH designations – was not used. In the absence of survey data in the South Atlantic, EFH was not designated south of Cape Hatteras, nor beyond the edge of the NEFSC survey area on the edge of the continental shelf, even though spiny dogfish are known to occupy deep water over the continental slope and beyond (see Section 6.1.1).

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[3] Males and females were not measured separately in the ME-NH trawl survey until 2005.

Table 2. Sources of bottom trawl survey data used to produce updated (Alternative 2B) EFH maps for spiny dogfish.

Survey Area	Years of data	Time of Year	Inclusion Criteria	Comments
NE region continental shelf/GOM (NEFSC)	1981-2011	Spring and Fall	90th percentile of ten minute square geometric mean catch (nos/tow)	Maximum data resolution for sex-specific life stages
Coastal waters VA to RI (NEAMAP)	2008-2011	Spring and Fall	For each ten minute square - life stage present in 10% or more of tows	No sex
State Surveys				
Gulf of Maine (MEDMR)	2000-2004	Spring and Fall	"	No sex
Gulf of Maine (MEDMR)	2005-2011	Spring and Fall	"	Sex recorded
MA state waters (MADMF)	1981-2011	Spring and Fall	"	Sex recorded
Narragansett Bay and RI coastal waters (RIDEM)	1980-2011	Monthly June-Nov; Spring and Fall	"	No sex
Long Island Sound (CTDEP)	1984-2011	Spring and Fall	"	No sex
NJ coastal waters (NJDEP)	1988-2011	5 times a year	"	No sex
Delaware Bay (NJDEP)	1991-2011	Monthly April-Oct?	"	No sex
Delaware Bay (DNREC)	1966-2010	Monthly March-Dec	"	No sex
Lower Chesapeake Bay (VIMS)	1955-2011	Monthly	"	No sex

5.2.1.2.1 Maps

EFH maps were produced using ArcGIS 9.2 software (ESRI©). The maps show the geographical extent of EFH for each of the life stages. The text descriptions provide information on the physical characteristics of EFH (e.g., depth and temperature) that generally exist within the areas mapped as EFH. The No Action (status quo) and the revised action designations selected by the Council (text and maps) are provided later in this section. Also, detailed color maps (available only in electronic versions of this amendment) showing all the eligible ten minute squares and those that qualified as EFH in the preferred (option 2A) alternative are included in an appendix to this document.

The updated EFH maps of the life history stages contain relative abundance data from spring and fall research bottom trawl surveys conducted by the NEFSC and percent frequency of occurrence

data from state and other inshore surveys conducted at various time periods in state waters. The sources and characteristics of the data used to update the EFH maps are summarized in Table 2.

NEFSC Data

A description of the NEFSC survey design and sampling methods is described in Reid *et al*. (1999). The spatial extent of the trawl data ranges from the Gulf of Maine to Cape Hatteras, North Carolina[4]. The data were mapped by ten-minute square (tms) as cumulative percentages (75, 90, 95, and 100%) of the back-transformed mean densities (representing a pseudo-geometric mean), where the mean density per tms ($\bar{d}_j$) was computed as:

$$\bar{d}_j = \sum_{i=1}^{n_j} \frac{(\ln(d_i)+1)_j}{n_j}$$

where $(\ln(d_i)+1)_j$ is the log-transformed density plus 1 at station *i* for tms *j* and n_j is the number of stations sampled within each tms. Appendix 2 contains maps of the different cumulative percentage classes. For the preferred alternatives, only the 90th percentile was used in determining the geographic scope of EFH. (For the non-preferred 50th, 75th, and 100th percentile alternatives, see the appendix). Mean densities were not computed for tms where fewer than three tows were made during the time series.[5]

State and Other Inshore Surveys

Due to differences in survey methodologies and the lack of gear and vessel conversion factors between various state surveys and state and NEFSC surveys, the state data were mapped as percent frequency of occurrence (percentage of positive tows for the size or sex/size range of dogfish in each life history stage) whereby tms with ≥ 10% occurrence for a particular life stage were considered as EFH and tms with < 10% occurrence were not. For tms where there is overlap in the sampling coverages of the NEFSC and state surveys, the NEFSC survey data was given precedent because it is more quantitative.

5.2.1.2.2 Text descriptions

Revised text descriptions were written based on available information relating to the physical habitat characteristics for each species and life stage. Changes to the status quo text descriptions were made based on habitat-related information in the revised edition of the EFH source document (Stehlik 2007).

[4] A portion of the area surveyed by the NEFSC trawl survey in the Gulf of Maine extends into Canadian waters. Catch data from Canada were analyzed in the process of computing cumulative percentages by tms (see maps in appendix), but only tms in U.S. waters are shown in the final EFH maps in this section of the document (tms in Canada were removed from the maps).

[5] A ten minute square of latitude and longitude is in reality a rectangle, not a square, that in the northwest Atlantic is approximately 7.5 x 10 nautical miles in size, The width of each "square" varies with latitude, measuring 10 n miles at the equator to very small distances as you approach the poles.

5.2.2 Alternative 2A: No Action. (Do Not Update EFH Designations for Spiny Dogfish)

Under this alternative, this review of EFH information for spiny dogfish would not result in any modifications to the status quo text descriptions. They would remain as established in the original FMP. Specifically, the geographical areas within which EFH potentially exists are depicted in the maps and the specific habitat features (depth, temperature, salinity) that must apply in any particular location in order for it to actually qualify as EFH are defined in the corresponding text description.[6] Under the No Action alternative, the EFH designations definitions would be maintained as:

Juveniles (females <83 cm, males <60 cm):
1) North of Cape Hatteras, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where juvenile dogfish were collected in the NEFSC trawl surveys (see Figure 1). 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft (see Figure 2). 3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts (see Figure 3). Generally, juvenile dogfish are found at depths of 33 to 1,280 ft in water temperatures ranging between 37˚F and 82˚F.

Adults (females >= 83 cm, males >=60 cm):
1) North of Cape Hatteras, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where adult dogfish were collected in the NEFSC trawl surveys (see Figure 4??). 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1476 ft (see Figure 2). 3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts (see Figure 3). Generally, adult dogfish are found at depths of 33 to 1,476 ft in water temperatures ranging between 37˚F and 82˚F.

The status quo EFH designations for juvenile and adult spiny dogfish also include the full salinity (>25 ppt) zones of a number of coastal bays and estuaries (Passamaquoddy Bay, Englishman/Machias Bays, Narraguagus Bay, Blue Hill Bay, Penobscot Bay, Muscongus Bay, Damariscotta River, Sheepscot River and Bay, Kennebec/Androscoggin Rivers, Casco Bay, Saco Bay, Massachusetts Bay, Cape Cod Bay; see Figure 3). These areas were identified in a report of the NOAA National Ocean Service Estuarine Living Marine Resources (ELMR) Program (Jury et al. 1994). Areas that were included in the original designations were where spiny dogfish juveniles and adults were determined to be common, abundant, or highly abundant.

[6] For example, the actual extent of EFH for adult dogfish south of Cape Hatteras is limited to a maximum depth of 1,476 ft even though the map includes the entire continental shelf.

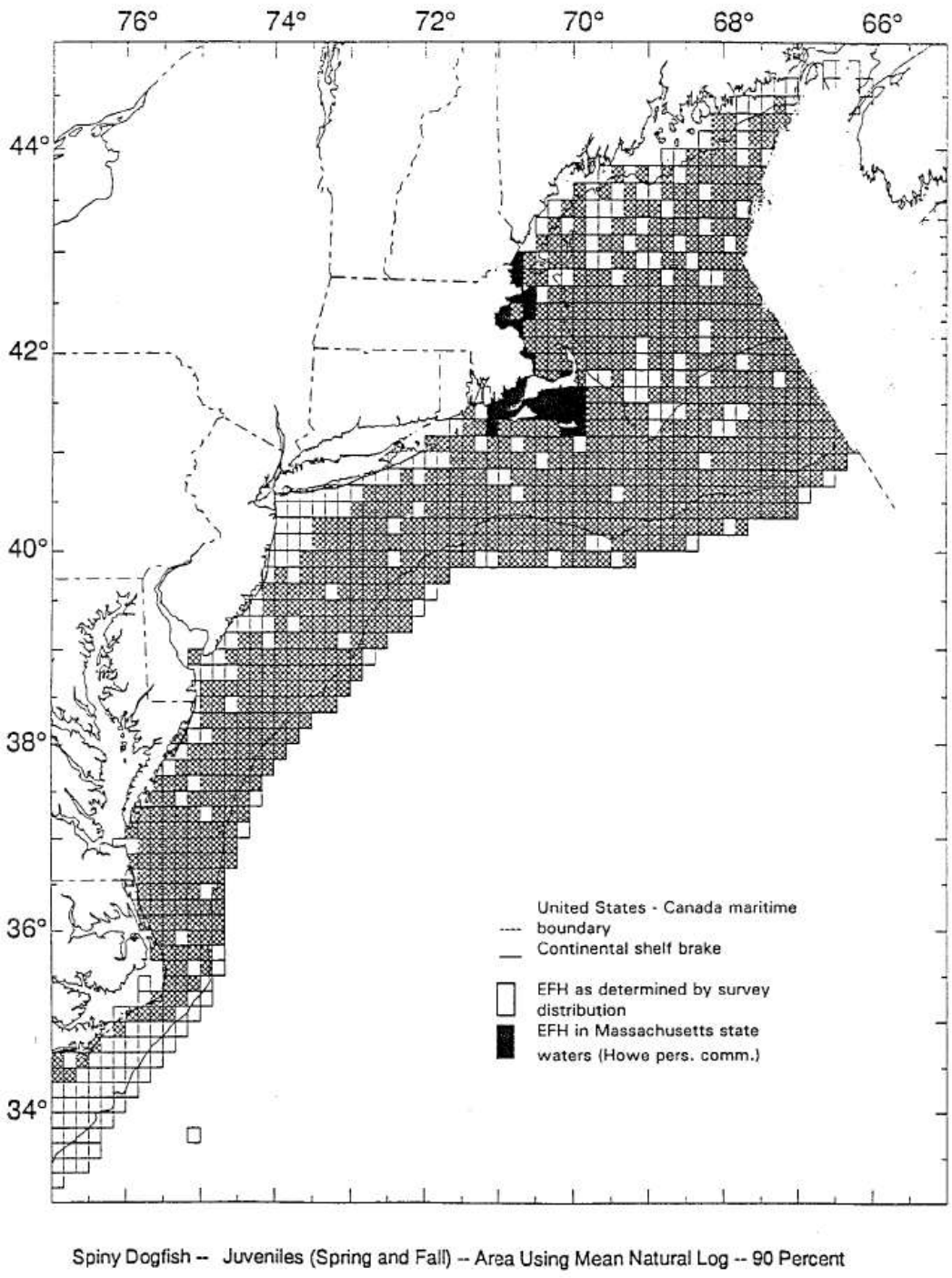

Figure 1. Status Quo EFH for juvenile spiny dogfish which comprises the top 90% of the ranked areas where female and male juvenile spiny dogfish were collected by the NEFSC trawl survey between 1963 and 1996. This depiction of EFH is taken from the original Spiny Dogfish FMP and would be maintained under the No Action Alternative

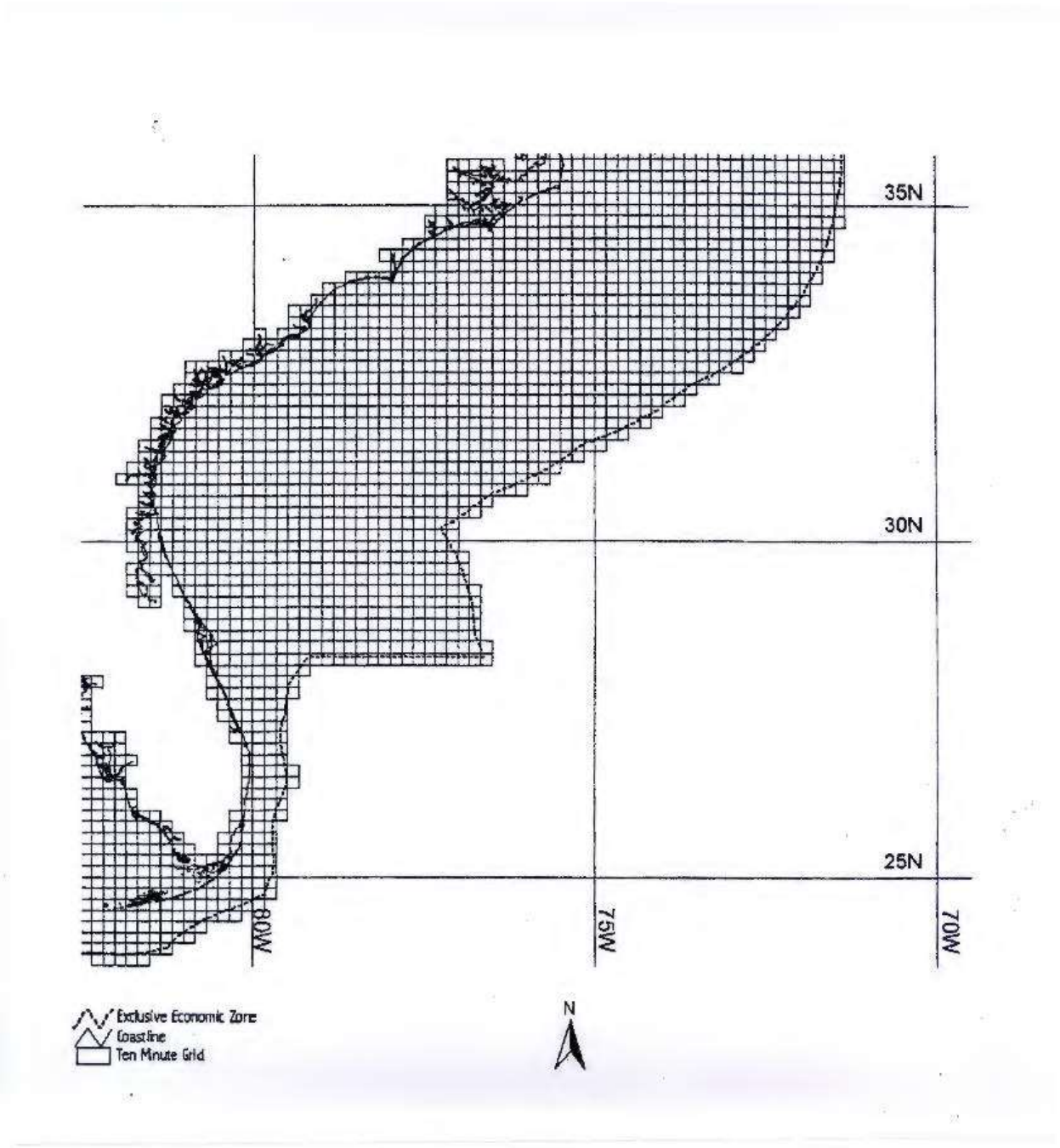

Figure 2. Geographical extent of the status quo EFH designation for juvenile and adult spiny dogfish south of Cape Hatteras. This depiction of EFH is taken from the original Spiny Dogfish FMP and would be maintained under the No Action Alternative

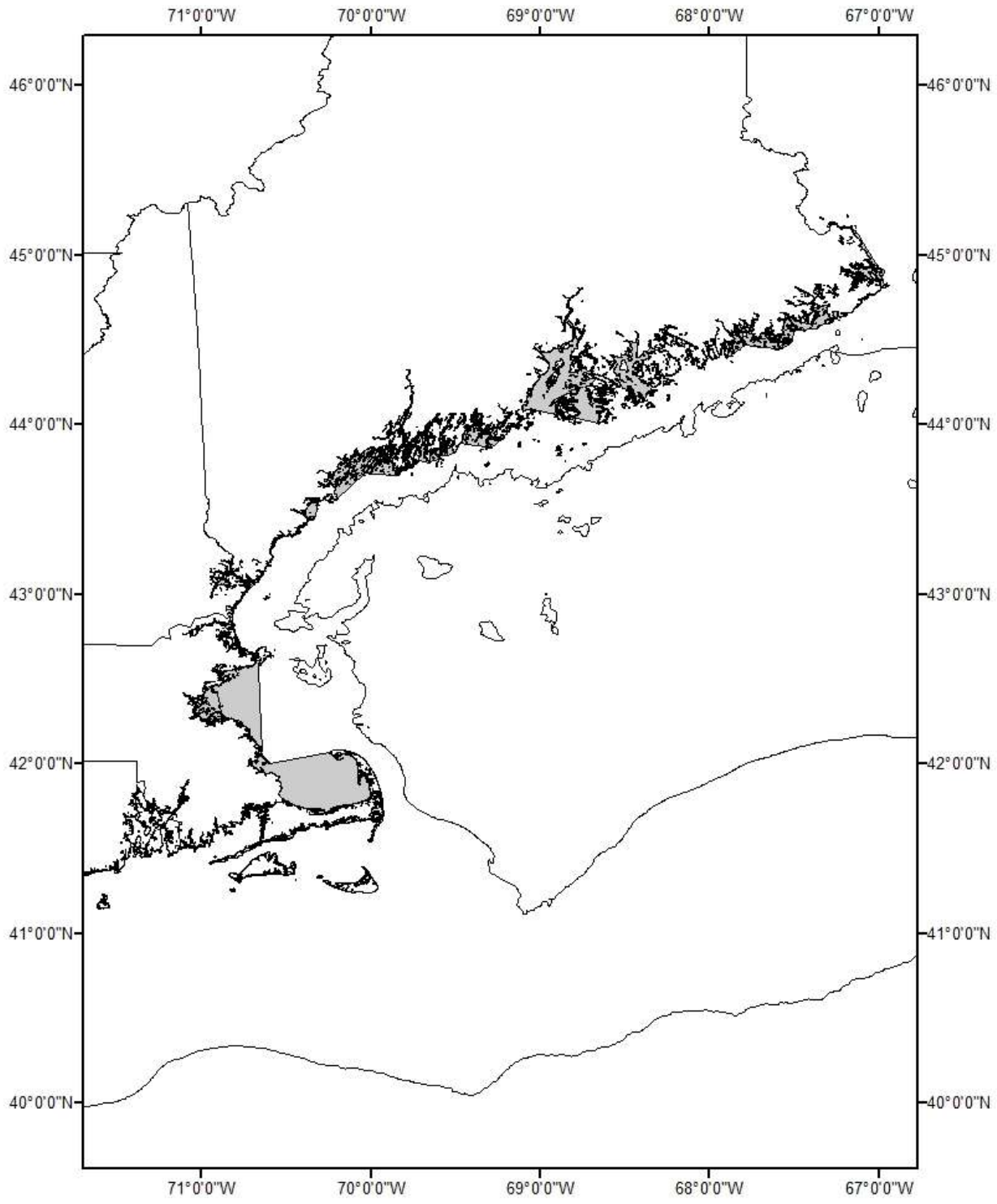

Figure 3. Inshore bays and estuaries included in the status quo designations for juvenile and adult spiny dogfish.

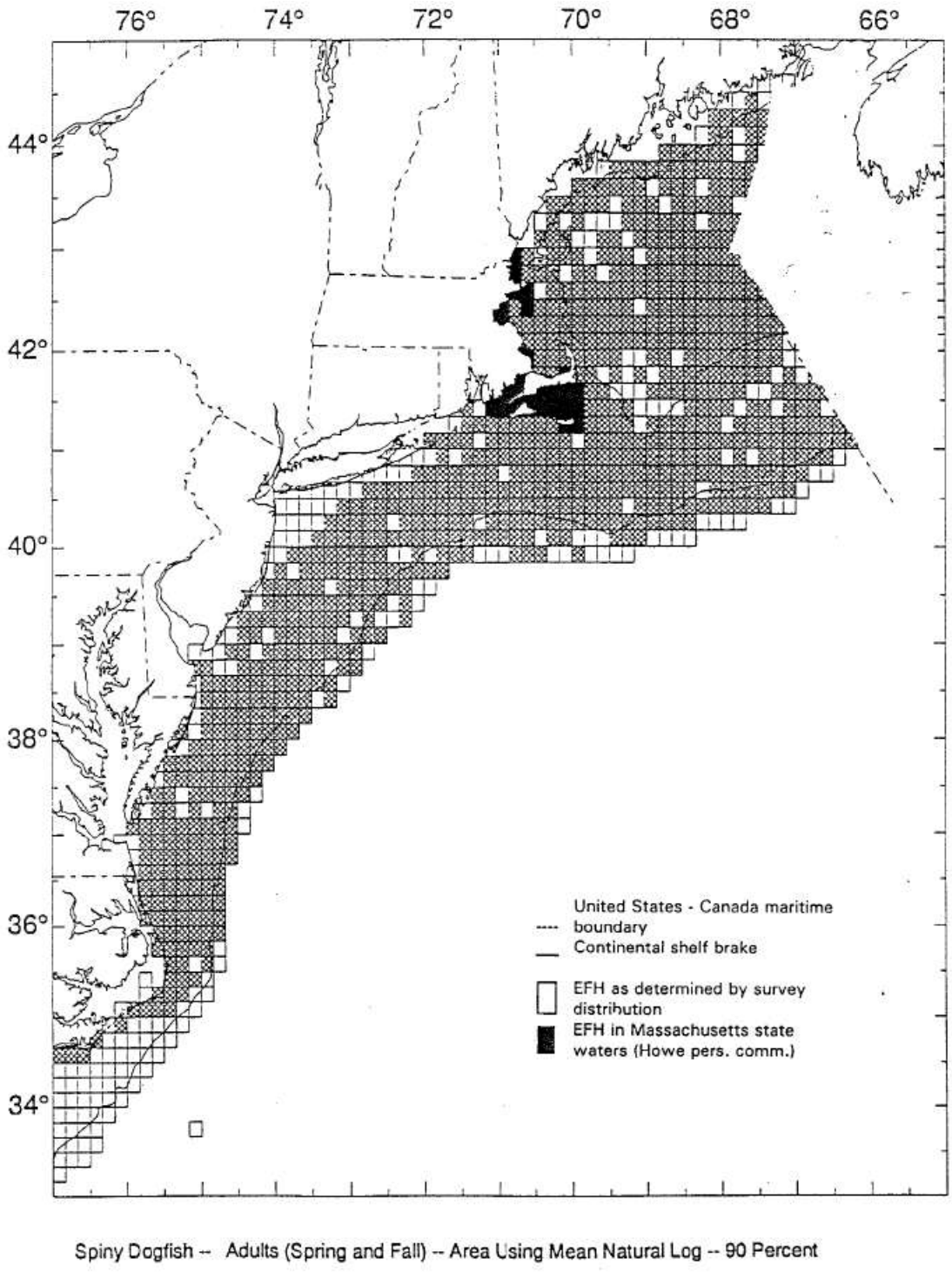

Figure 4. Status Quo EFH for adult spiny dogfish which comprises the top 90% of the ranked areas where female and male adult spiny dogfish were collected by the NEFSC trawl survey between 1963 and 1996. This depiction of EFH is taken from the original Spiny Dogfish FMP and would be maintained under the No Action Alternative.

5.2.3 Alternative 2B (Preferred): Updated EFH Designations

The Councils chose Alternative 2B as their preferred alternative in order to bring the FMP into compliance with the EFH Final Rule requirement to periodically review and, if necessary, revise EFH designations. Under this alternative, the text and maps used to establish the EFH designations for spiny dogfish are updated to include federal and other biological survey data that have been collected in a more recent timeframe. Because the different sex and size-specific life history stages of spiny dogfish occupy different pelagic and epibenthic habitats over the course of a year, the up-dated EFH designations (maps and texts) apply separately to juveniles of both sexes, sub-adult males, sub-adult females, adult males, and adult females. Thus, the revised designations apply to five distinct life stages rather than two. The revised maps define EFH as potentially applying within the ten minute squares that account for the 90th percentile of the mean catch by square from the last 30 years of the NEFSC spring and fall trawl surveys, The maps also include ten minute squares where spiny dogfish were present in 10% or more of the individual bottom trawl hauls made in each square during state and other inshore surveys. The 90th percentile in the spatial analysis is an inclusive threshold that is used to account for inter-year variability as well as the large north-south and inshore-offshore movements undertaken by spiny dogfish in a given year. These spatial depictions of spiny dogfish distributions as well as the revised text descriptions of EFH (below and compared to Alternative 2A in Table 3) comprise the proposed new EFH designation for each of the life stages. See Section 5.2.3 for a more detailed summary of the methods used to develop the Alternative 2B EFH designations.

Alternative 2B EFH Text Definitions

Juveniles (male and female, <36 cm):
Pelagic and epibenthic habitats, primarily in deep water on the outer continental shelf and slope between Cape Hatteras and Georges Bank and in the Gulf of Maine, as depicted in Figure 5. Young are born mostly on the offshore wintering grounds from November to January, but new borns (neonates or "pups") are sometimes taken in the Gulf of Maine or southern New England in early summer.

Female Sub-Adults (36-79 cm):
Pelagic and epibenthic habitats throughout the region, as depicted in Figure 6. Sub-adult females are found over a wide depth range in full salinity seawater (32-35 ppt) where bottom temperatures range from 7 to 15°C. Sub-adult females are widely distributed throughout the region in the winter and spring when water temperatures are lower, but very few remain in the Mid-Atlantic area in the summer and fall after water temperatures rise above 15°C.

Male Sub-Adults (36-59 cm):
Pelagic and epibenthic habitats, primarily in the Gulf of Maine and on the outer continental shelf from Georges Bank to Cape Hatteras, as depicted in Figure 7. Sub-adult males are found over a wide depth range in full salinity seawater (32-35 ppt) where bottom temperatures range from 7 to 15°C. Sub-adult males are not as widely distributed over the continental shelf as the females and are generally found in deeper water. They are widely distributed throughout the region in the winter and spring when water temperatures are lower, but very few remain in the Mid-Atlantic area in the summer and fall after water temperatures rise above 15°C.

Female Adults:
Pelagic and epibenthic habitats throughout the region, as depicted in Figure 8. Adult females are found over a wide depth range in full salinity seawater (32-35 ppt) where bottom temperatures range from 7 to 15°C. They are widely distributed throughout the region in the winter and spring when water temperatures are lower, but very few remain in the Mid-Atlantic area in the summer and fall after water temperatures rise above 15°C.

Male Adults:
Pelagic and epibenthic habitats throughout the region, as depicted in Figure 9. Adult males are found over a wide depth range in full salinity seawater (32-35 ppt) where bottom temperatures range from 7 to 15°C. They are widely distributed throughout the region in the winter and spring when water temperatures are lower, but very few remain in the Mid-Atlantic area in the summer and fall after water temperatures rise above 15°C.

Alternative 2B EFH Maps

EFH maps for Alternative 2B are provided in Figures 5 through 9 below. Additional maps that indicate the 25th through 100th percentiles of spiny dogfish distribution are provided in the Appendix.

In the figures below, catch data from all available research survey sources are displayed on a single EFH map for each life history stage in order to show data from all data sources combined and to facilitate comparisons between cumulative percentage categories for NEFSC survey data. For each map, those ten minute squares where the criteria for designation as EFH were not met are displayed as uncolored. The 90th cumulative percentile using NEFSC survey data and the occurrence of spiny dogfish in >10% of tms for state and other inshore surveys are considered EFH and are displayed in black. Because of the differences in methodology, the visualization of EFH should be interpreted with caution. It is possible that primarily offshore distribution of smaller dogfish which is apparent in the NEFSC trawl catches of recruits and juveniles is more representative than the nearshore ten minute squares that satisfy the >10% capture rate criteria.

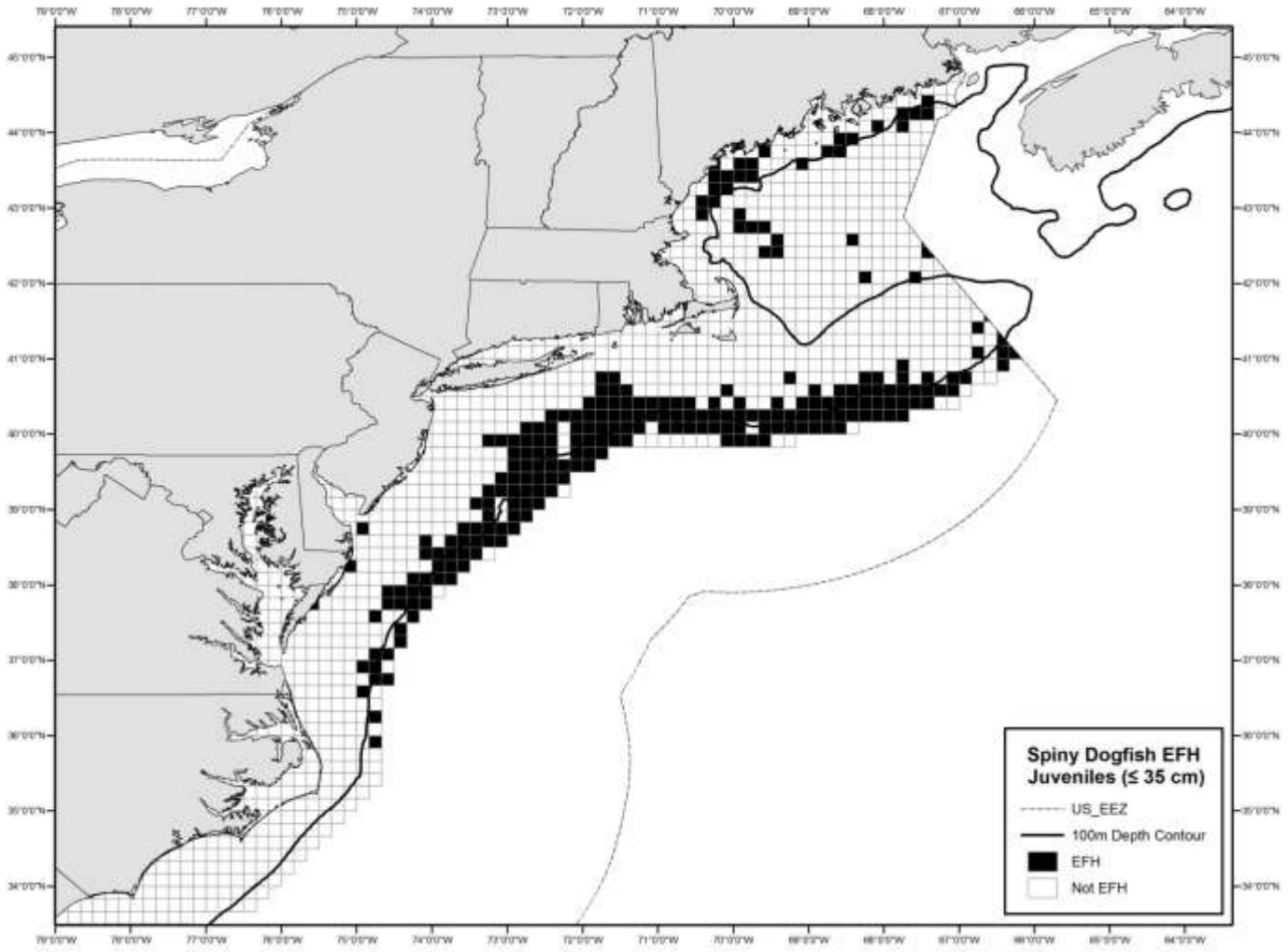

Figure 5. EFH for spiny dogfish juveniles (both sexes, length ≤ 35 cm) based on spiny dogfish encountered by the NEFSC trawl survey, state and other nearshore surveys between 1981 and 2011. EFH is defined as the 90th percentile of the catches by ten minute square in the NEFSC trawl survey and those ten minute squares where spiny dogfish occurred in >10% of the tows for state and other nearshore surveys. This depiction of EFH would apply under the Action Alternative (2B).

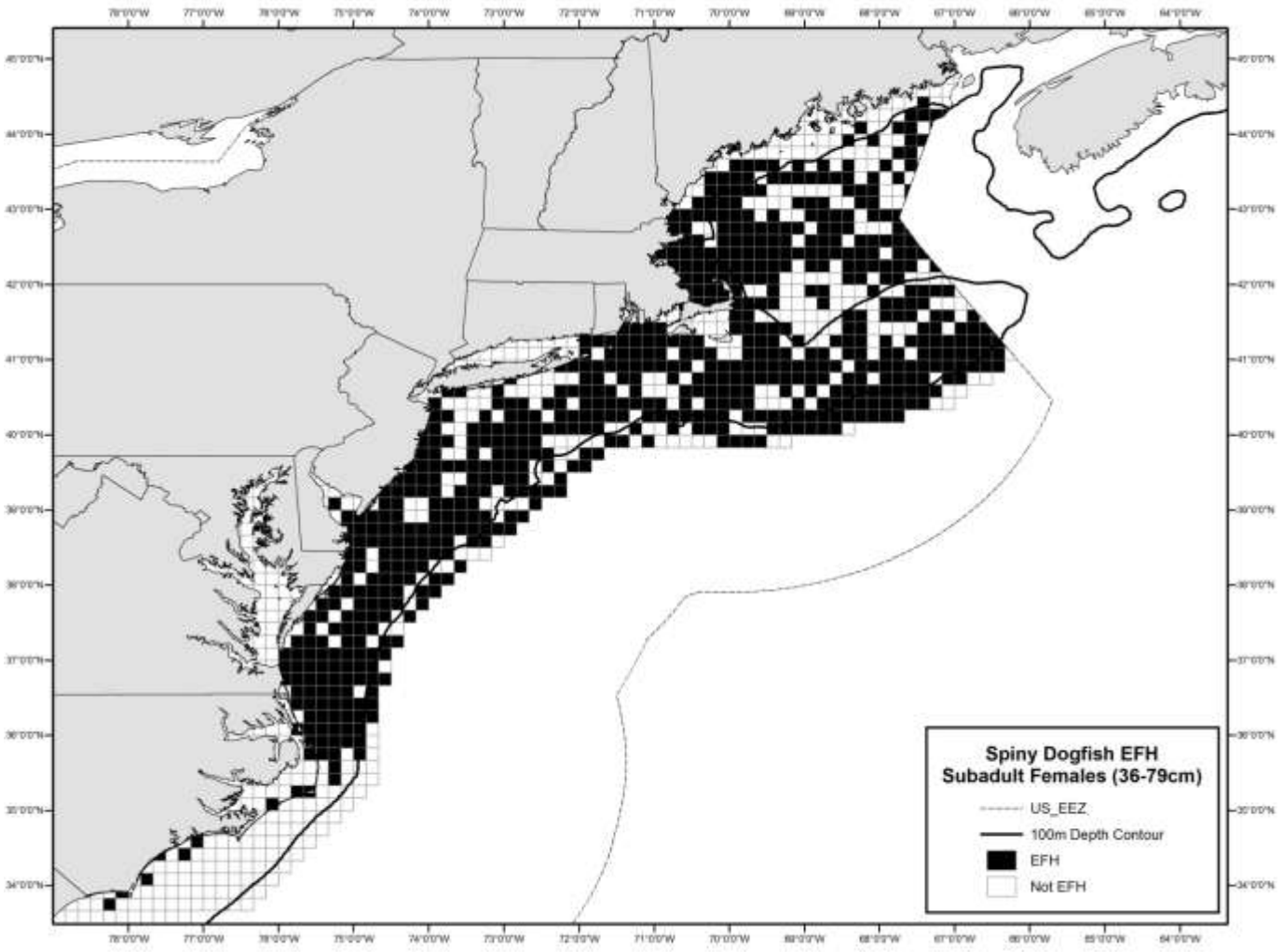

Figure 6. EFH for female spiny dogfish subadults (length 36 – 79 cm) based on spiny dogfish encountered by the NEFSC trawl survey, state and other nearshore surveys between 1981 and 2011. EFH is defined as the 90th percentile of the catches by ten minute square in the NEFSC trawl survey and those ten minute squares where spiny dogfish occurred in >10% of the tows for state and other nearshore surveys. This depiction of EFH would apply under the Action Alternative (2B).

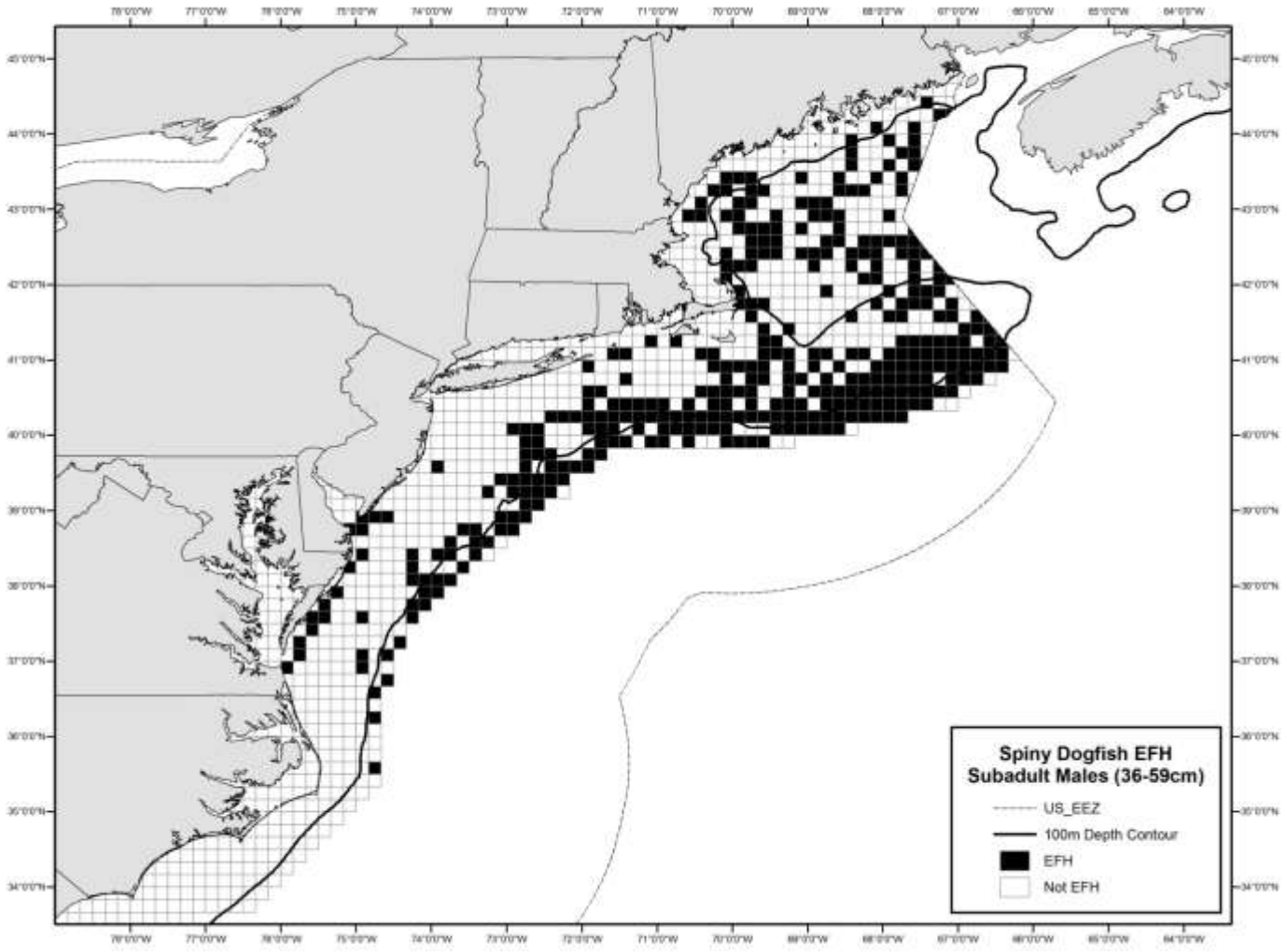

Figure 7. EFH for male spiny dogfish sub-adults (length 36 – 59 cm) based on spiny dogfish encountered by the NEFSC trawl survey, state and other nearshore surveys between 1981 and 2011. EFH is defined as the 90th percentile of the catches by ten minute square in the NEFSC trawl survey and those ten minute squares where spiny dogfish occurred in >10% of the tows for state and other nearshore surveys. This depiction of EFH would apply under the Action Alternative (2B).

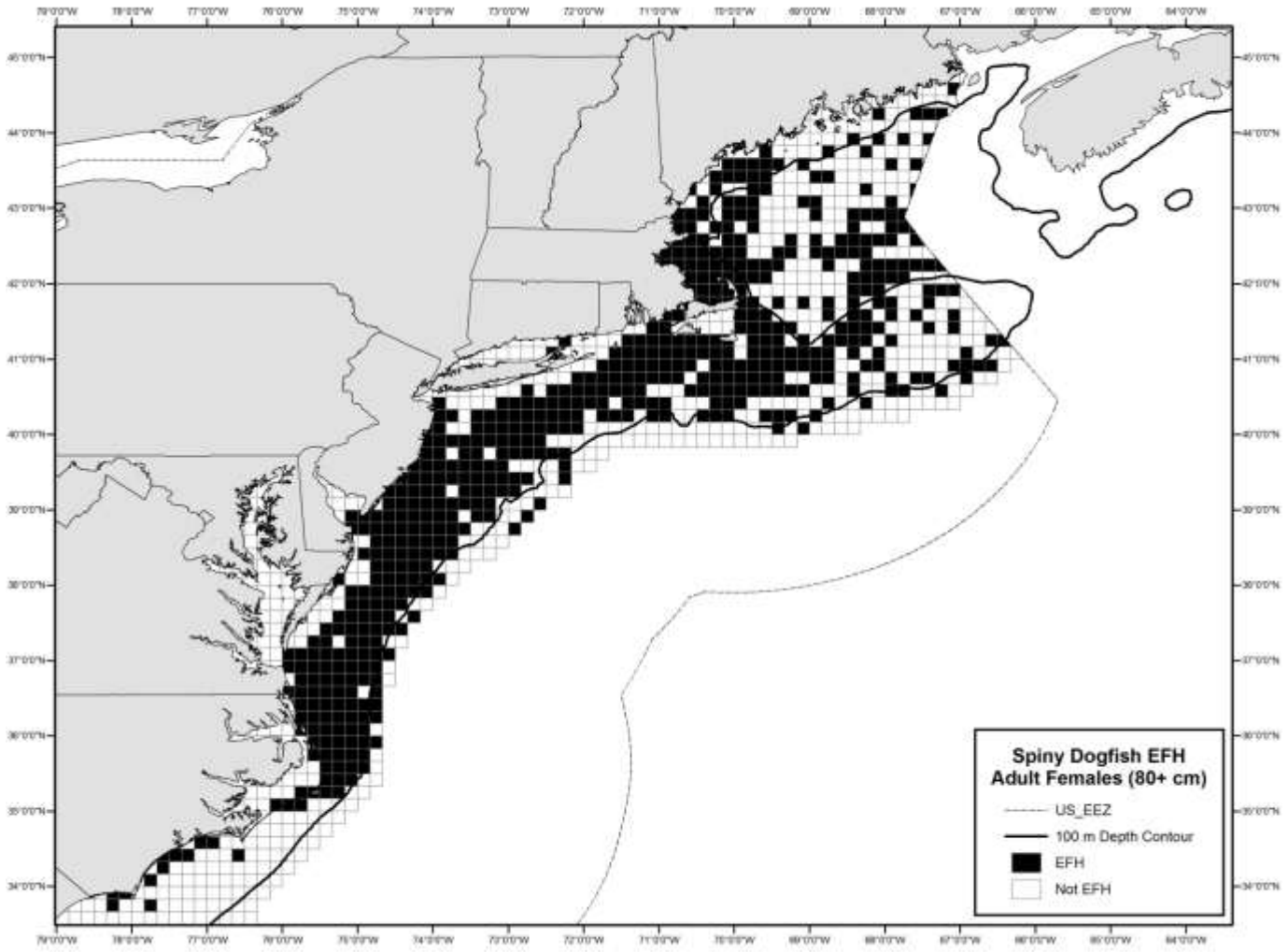

Figure 8. EFH for female spiny dogfish adults (length 80+ cm) based on spiny dogfish encountered by the NEFSC trawl survey, state and other nearshore surveys between 1981 and 2011. EFH is defined as the 90th percentile of the catches by ten minute square in the NEFSC trawl survey and those ten minute squares where spiny dogfish occurred in >10% of the tows for state and other nearshore surveys. This depiction of EFH would apply under the Action Alternative (2B).

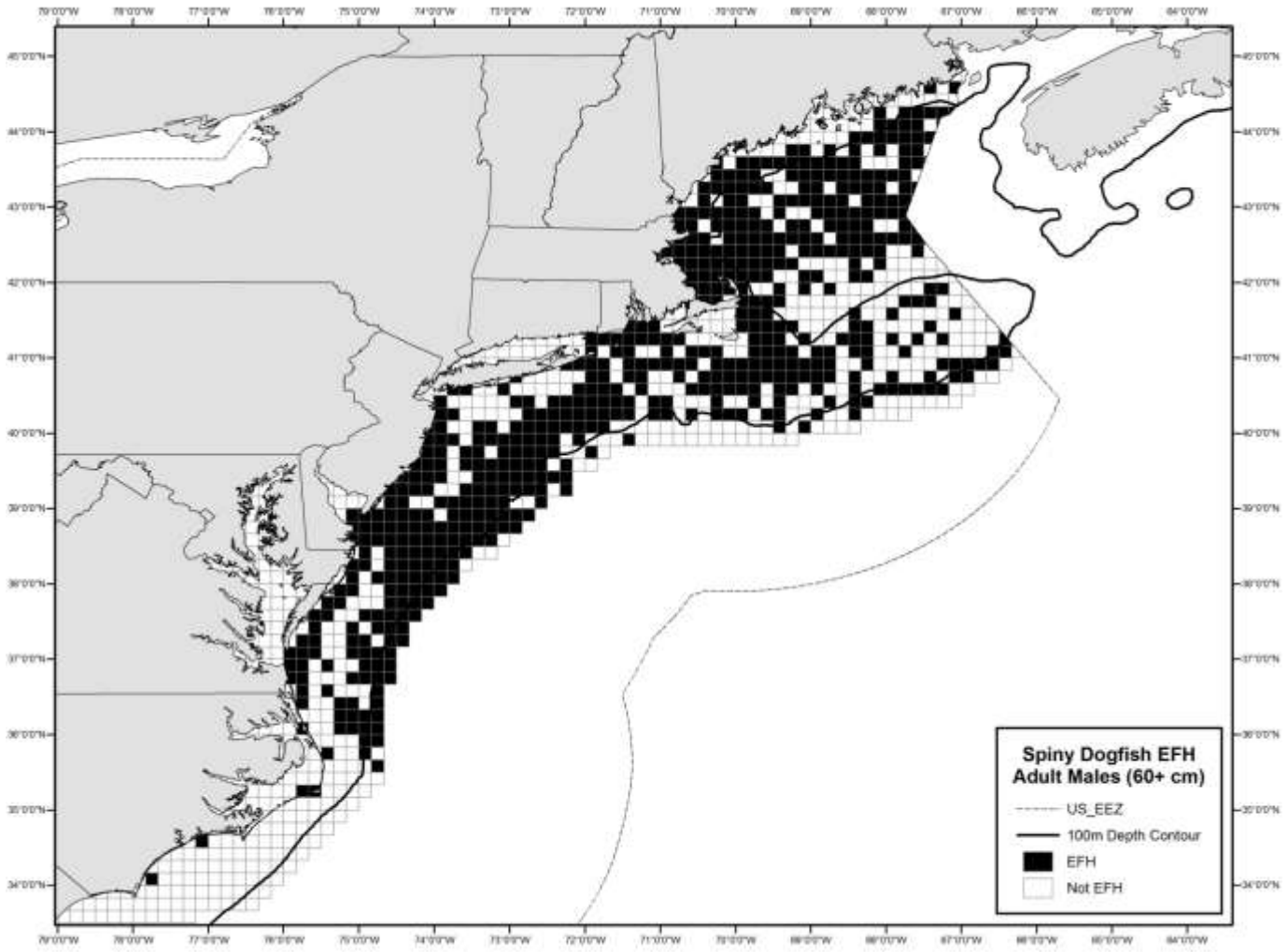

Figure 9. EFH for male spiny dogfish adults (length 60+ cm) based on spiny dogfish encountered by the NEFSC trawl survey, state and other nearshore surveys between 1981 and 2011. EFH is defined as the 90th percentile of the catches by ten minute square in the NEFSC trawl survey and those ten minute squares where spiny dogfish occurred in >10% of the tows for state and other nearshore surveys. This depiction of EFH would apply under the Action Alternative (2B).

Table 3. Comparison of the text definitions for EFH under the status quo (Alt 2A) and update (Alt 2B).

	Life stage Definition		EFH North of Cape Hatteras		South of Cape Hatteras		Inshore	
	Status Quo (Alt 2A)	**Update (Alt 2B)**	**Status Quo (Alt 2A)**	**Update (Alt 2B)**	**Status Quo (Alt 2A)**	**Update (Alt 2B)**	**Status Quo (Alt 2A)**	**Update (Alt 2B)**
Recruits*	Not provided	Spiny dogfish or both sexes less than or equal to 35 cm.	Not provided	The area associated with 90% of the cumulative geometric mean catches of juvenile spiny dogfish based on Northeast Fishery Science Center (NEFSC) trawl data.	Not provided	Waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft	Not provided	The areas where inshore (NEAMAP, SEAMAP, state) research surveys indicate ≥ 10% presence in survey samples.
Male and Female Sub-Adults*	Not provided	Male spiny dogfish greater than 36 cm but less than 60 cm FL, Female spiny dogfish greater than 36 cm but less than 80 cm FL	EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where juvenile dogfish were collected in the NEFSC trawl surveys	The area associated with 90% of the cumulative geometric mean catches of juvenile spiny dogfish based on Northeast Fishery Science Center (NEFSC) trawl data.	Waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft	Waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft	"seawater" portions of the estuaries where [juvenile] dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts	The areas where state and other inshore (NEAMAP, SEAMAP, state) research surveys indicate ≥ 10% positive encounters in survey samples.
Male and Female Adults	Not provided	Male spiny dogfish greater than or equal to 60 cm FL, Female spiny dogfish greater than or equal to 80 cm FL	EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where adult dogfish were collected in the NEFSC trawl surveys	The area associated with 90% of the cumulative geometric mean catches of adult spiny dogfish based on Northeast Fishery Science Center (NEFSC) trawl data.	the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1476 ft	the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1476 ft	"seawater" portions of the estuaries where [adult] dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts	The areas where state and other (NEAMAP, SEAMAP) research surveys indicate ≥ 10% frequency of occurrence

* Collectively referred to as "juveniles" in the original EFH designation

5.3 DELAYED IMPLEMENTATION OF COMMERCIAL QUOTA

Alternative 3A: No action. (No Commercial Quota Until Final Rule Effective)
Under this alternative, the fishery would continue to potentially open the start of the fishing year (May 1) without a commercial quota and continue to operate until the effective date for the final rule for the commercial quota for that fishing year. The daily possession limit from the previous year, however, would be maintained until replaced by the possession limit specified for the new fishing year.

Alternative 3B (Preferred): Maintain Existing Quota until Effective Date for New Quota
Under this alternative, if the effective date for the commercial quota in a given fishing year falls after May 1, then the commercial quota from the previous year would remain in effect until the effective date for the quota specified for the new fishing year. The Councils chose Alternative 3B as their preferred alternative in order to close this administrative loophole and be consistent across FMPs.

5.4 COMMERCIAL QUOTA ALLOCATION

The action alternatives under this issue are envisioned as alleviating conflicts that currently exist as a result of the different federal and interstate allocation schemes for the coastwide commercial quota. The seasonal allocation scheme in the federal FMP was originally put in place to serve as a proxy for geographic allocation. The roughly 58% / 42% split between Period 1 (May 1 – Oct 31) and Period 2 (Nov 1 – Apr 30), respectively was reflective of the proportional landings of the managed resource among northern and southern states during the fishery of the 1990s. In 2008, the Commission implemented Addendum II (ASMFC 2008) which explicitly allocated the coastwide quota such that 58% went to the "northern region" (ME-CT), and 42% went to the "southern region" (NY - NC). In 2011, the Commission further modified their plan through Addendum III (ASMFC 2011) such that the southern region was dissolved and its 42% was divided state-by-state according to Table 4 below.

Table 4. Percent allocation of the coastwide annual quota (from Addendum III to the ISFMP).

Northern Region (ME-CT)	Southern Region					
	NY	NJ	DE	MD	VA	NC
58%	2.707%	7.644%	0.896%	5.920%	10.795%	14.036%

It is always possible that the Commission could further refine their geographic allocation scheme in subsequent addenda. For example, state-by-state allocation of the northern region share has been discussed, but no action is currently pending.

Alternative 4A: No Action. (Maintain Seasonal Allocation of the Commercial Quota)
Under this alternative, the existing scheme, which allocates 57.9% of the annual commercial quota to Period 1 (May 1 – Oct 31) and 42.1% to Period 2 (Nov 1 – Apr 30), would be maintained.

Alternative 4B (Preferred): Eliminate Allocation of the Commercial Quota.
Under this alternative, a commercial quota would be specified for a given fishing year, but that quota would not be allocated either periodically or geographically. The Councils chose Alternative 4B as their preferred alternative because it was perceived as the alternative that was the least disruptive to fishery operations that were subject to management measures established under both the federal and interstate FMPs.

Alternative 4C: Match the Geographic Allocation of the Commercial Quota under the Commission's Interstate Fishery Management Plan.
Under this alternative, minimizing conflicts resulting from the two allocation schemes would be accomplished by matching the Commission's geographic allocation of the quota in the federal FMP, specifically by dividing the coastwide quota according to the percentages in Table 4.

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND FISHERIES

6.1 Description of the Managed Resource

6.1.1 Spiny Dogfish Biology and Ecological Relationships

The spiny dogfish, *Squalus acanthias*, is a small coastal shark with a circumboreal and temperate distribution in the northern and southern hemispheres. In addition to being the most abundant shark in the western North Atlantic, it is also one of the most highly migratory species of the Atlantic coast (Burgess 2002). In the northwest Atlantic, their range extends from Greenland to northeastern Florida but they are most abundant from Nova Scotia to Cape Hatteras, North Carolina. Seasonal inshore-offshore movements and coastal migrations are thermally induced. Worldwide, spiny dogfish prefer a temperature range of 7-15°C (Compagno 1984). Generally, spiny dogfish spend summers in inshore waters and overwinter in deeper offshore waters. Spiny dogfish prefer full salinity seawater and do not ascend estuaries. They are usually epibenthic, but occur throughout the water column and are found in a depth range from nearshore shallows to offshore shelf waters (Burgess 2002)., They swim in large schools consisting of large mature females, immature males and females, and medium sized animals (either mature males or immature females). Mature females are found inshore and juveniles are most common offshore (Burgess 2002). One of three large female dogfish with a satellite tag moved east from inshore waters of the Gulf of Maine at the end of October into deep water southeast of Georges Bank during the 65 days the tag remained in place, swimming as deep as 600 meters, but spending most of the time at depths <230 meters (Sulikowski et al. 2010). All three sharks displayed highly active vertical movement patterns during the day and night and remained within a temperature range of 5.2 to 14.9°C.

Spiny dogfish are ovoviviparous. Fertlilization and egg development occur internally and young are born in litters of one to fifteen (average six to seven). Females carry their young for 18-22 months (Burgess 2002). Young are born mostly on the offshore wintering grounds from November to January, but new borns (neonates or "pups") are sometimes taken in the Gulf of Maine or southern New England in early summer (Burgess 2002). Juvenile dogfish Sulikowski

et al (2013) reported catching large numbers of neonates east of Block Island, Rhode Island, in February 2012 while bottom trawling. Like many sharks, dogfish are slow-growing and long-lived. Full-term pups have been defined in growth studies as being larger than 24 cm stretch total length (Bubley et al. 2011). Spiny dogfish grow at similar rates until age 7, after that females grow faster and larger than males (Burgess 2002). Maximum ages reported for males and females are 35 and 40 years, respectively (Sosebee 1998). Females in U.S. waters mature at age 12-13 and lengths of 75-83 cm (Stehlik 2007). Most males mature at 6 years and about 60 cm (Burgess 2002).

Spiny dogfish are voracious feeders. Fishes accounted for 54% of their diet (by weight) in the western Atlantic and mollusks for 27% with a high degree of variability in species composition across seasons, areas and years (Bowman et al. (2000).[7] Schooling pelagic fishes such as herring, sand lance, mackerel, and menhaden are heavily consumed, but benthic species are also eaten as are squid, jellyfish and ctenophores (Burgess 2002). Spiny dogfish migrate vertically in the water column, feeding on forage fish that move toward the surface at night and on prey organisms near or on the bottom during the day. Juveniles (<36 cm) feed more heavily on squids and euphausiids than sub-adult (36-79 cm) dogfish, which consume more fish. The largest (>80 cm) animals are primarily piscivorous.[8] Their diet appears broadly related to abundance trends in some of their major prey items (e.g., herrings, Atlantic mackerel, codfishes, hakes, and squid). Benthic substrates suitable for epifaunal and infaunal prey must be soft rather than hard (Compagno 1984).

6.1.2 Spiny Dogfish Stock Status

Reports on "Stock Status," including annual assessment updates, Stock Assessment Workshop (SAW) reports, Stock Assessment Review Committee (SARC) panelist reports and peer-review panelist reports are available online at the NEFSC website: http://www.nefsc.noaa.gov. EFH Source Documents, which include details on stock characteristics and ecological relationships, are available at the following website: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

Figure 10 below provides a snapshot of several relevant characteristics of the spiny dogfish stock that influence management of the commercial fishery. Among these are: 1) Spiny dogfish are slow growing and, therefore, recovery of an overly exploited stock can require prolonged recovery if the stock were to be depleted. 2) Males and females grow at different rates and to different maximum sizes such that the largest fish in the population are almost all female and these are more valuable to the commercial fishery. 3) Litter size, or fecundity, increases with age such that productivity can be markedly hampered by an absence of large females in the stock. 4) Maturity is delayed (12-21 years) in females such that the immature stock is susceptible to mortality for a prolonged period before contributing to stock production.

[7] Diet composition data published by Bowman et al (2000) were collected from 2,662 dogfish collected in bottom trawl surveys between 1977 and 1980 and are reproduced in Stehlik (2007).
[8] Diet composition data by size class presented in Stehlik (2007) are from the NEFSC food habits database for the years 1973-2001.

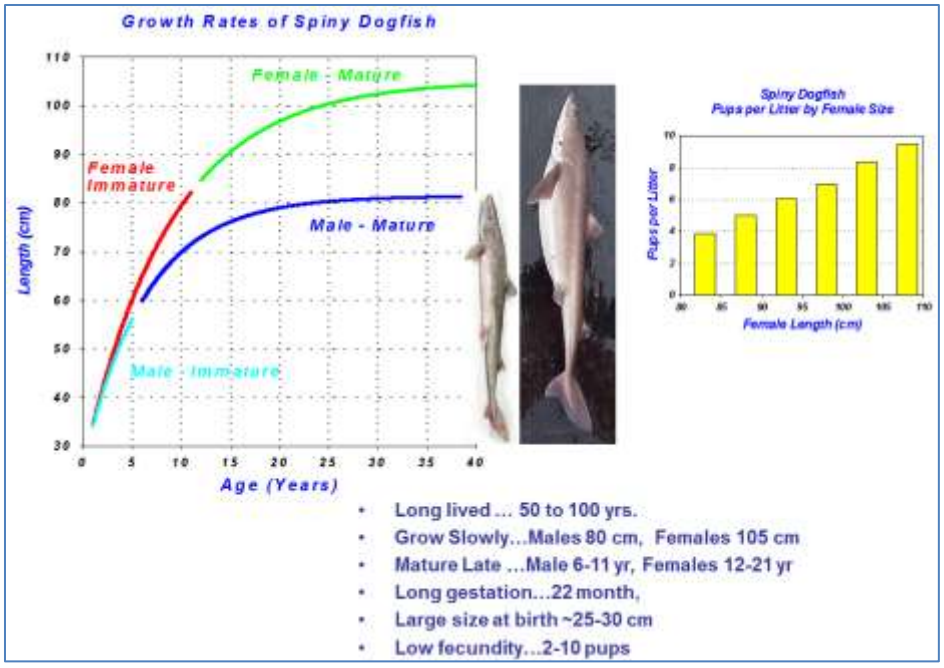

Figure 10. Summary of biological characteristics spiny dogfish relevant to the species' commercial fisheries exploitation (from Rago 2010 unpubl.).

Historical Stock Condition

At the onset of the domestic commercial fishery in the early 1990's, population biomass for the Northwest Atlantic stock of spiny dogfish was at its highest estimated level (approx. 1.2 billion lb). A large scale unregulated fishery developed and quickly depleted the stock of mature female spiny dogfish such that in 1997 a stock assessment showed that the stock was *overfished* (NEFSC 1997). The Spiny Dogfish FMP was developed in 1998 and implemented in 2000 in order to halt further depletion of mature female spiny dogfish and allow the stock to recover to a sustainable level. Because the directed commercial fishery concentrated on mature females, rebuilding required elimination of that directed fishery. The rebuilding program was highly successful and in 2010 the Northeast Regional Office (NERO) of NMFS communicated the *rebuilt* status of the stock to the Councils.

Current Stock Condition

<u>Not Overfished</u>

The Bmsy reference point defines when the stock is rebuilt (above Bmsy) and overfished (below ½ Bmsy). For spiny dogfish, Bmsy (proxy) is the spawning stock biomass that maximizes recruitment (SSBmax) in a Ricker type (dome-shaped) stock-recruitment model. SSBmax is estimated to be 159,288 mt (351 M lb) with ½ of that target corresponding to the biomass threshold (79,644 mt; 175.5 M lb). In September 2011, the Northeast Fisheries Science Center (NEFSC) updated their assessment of the spiny dogfish stock using catch data (2010), and results from the 2011 trawl survey. The updated estimate of SSB for 2011 is 169,415 mt (373.496 M lb), about 6% above SSB_{max} (159,288 mt). In updating the assessment, the NEFSC estimated a *100% probability that the stock is not overfished*.

Overfishing not Occurring

A review by the Council's SSC in 2011 was conducted to establish its endorsement of a fishing mortality reference point that defines when overfishing is occurring (Fmsy). The updated fishing mortality reference point provided by the NEFSC is $F_{msy} = 0.2439$. All accountable sources of removals contribute to the estimate of fishing mortality (F) under the current assessment. For the most recent assessment year (2010), these include U.S. commercial landings (12.346 M lb), Canadian commercial landings (6 mt), U.S. dead discards (8.997 M lb), and U.S. recreational landings (46,297 lb). Total removals in 2010 were approximately 21.330 M lb corresponding to an F estimate of 0.09, well below $F_{msy} = 0.2439$. In updating the assessment, the NEFSC estimated a *100% probability that overfishing was not occurring* ($F_{2010} < F_{threshold}$).

6.1.2.1 Commercial Fishery

Calendar year harvest estimates from 1989 -2012 are provided in Table 5 and Figure 11. These include landings from U.S. commercial and recreational sectors as well as the Canadian commercial fishery. A thorough characterization of the historic (pre-FMP) fishery for spiny dogfish is given in Section 2.3 of the FMP (MAFMC 1999).

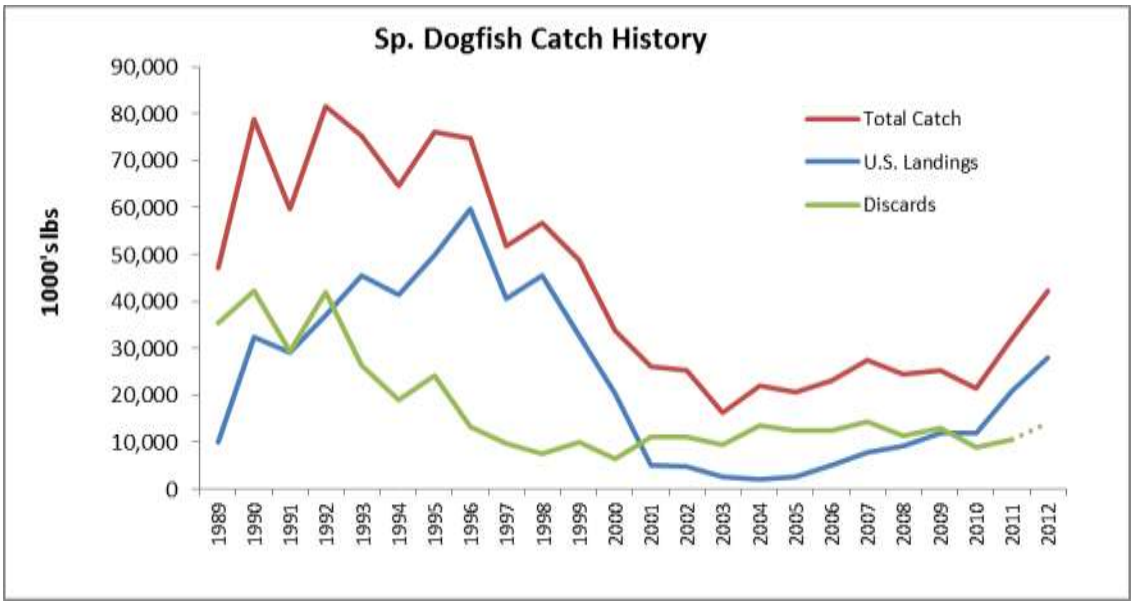

Figure 11. History of spiny dogfish landings and discards and total catch from 1989 – 2012. From NMFS 2011.

Table 5. Landings of spiny dogfish (1,000s lb) in the Northwest Atlantic Ocean for calendar years 1989 to 2012.

Year	US Comm	US Rec	Canada	Total (NW Atl.Stock)
1989	9,903	922	368	11,193
1990	32,476	395	2,886	35,757
1991	29,050	289	677	30,016
1992	37,166	474	1,914	39,554
1993	45,510	265	3,164	48,939
1994	41,442	342	4,012	45,796
1995	49,776	150	2,108	52,034
1996	59,825	55	950	60,830
1997	40,457	146	983	41,586
1998	45,477	86	2,326	47,889
1999	32,750	117	4,610	37,477
2000	20,408	11	6,043	26,462
2001	5,057	62	8,422	13,541
2002	4,848	452	7,901	13,201
2003	2,579	88	2,870	5,537
2004	2,165	231	5,207	7,603
2005	2,529	99	5,004	7,632
2006	4,958	207	5,377	10,542
2007	7,723	185	5,256	13,164
2008	9,057	472	3,466	12,995
2009	11,854	75	249	12,178
2010	12,347	35	13	12,395
2011	20,900	71	273	21,244
2012	23,501	42	143	23,686

Source: NMFS Commercial Fisheries Database, MRFSS data, and NAFO data.

Coastwide Landings Relative to Limits (Quotas)

Table 6 provides the coastwide quotas and landings for the spiny dogfish fishery since the establishment of the FMP in 2000. Toward the end of the federal rebuilding schedule that ended in 2010, substantial increases in stock biomass allowed for an increase in the federal quota in 2009 to 12 M lb while still maintaining the rebuilding fishing mortality rate. Under the interstate FMP, quota increases began earlier in 2006 – 2008 (Table 5). Note that in 2010-2012, the commercial quota implemented in state waters was lower than for federal waters. Both quotas were based on the same technical advice; however, the state water quota reflects reductions for overages in accordance with Addendum 2 to the ISFMP. Effective in the 2012 fishing year, accountability measures apply in federal waters in accordance with Amendment 2 to the federal FMP.

Table 6. Jurisdictional (federal and state) quotas and coastwide landings for fishing years 2000 - 2012.

Fishing year (May 1 - Apr 30)	Quota (M lb)		Landings (M lb)
	Federal	States'	
2000	4.0	n/a	8.2
2001	4.0	n/a	5.1
2002	4.0	n/a	4.8
2003	4.0	8.8	3.2
2004	4.0	4.0	1.5
2005	4.0	4.0	2.6
2006	4.0	6.0	6.6
2007	4.0	6.0	6.5
2008	4.0	8.0	9.0
2009	12.0	12.0	11.8
2010	15.0	14.4	14.5
2011	20.0	19.5	20.1
2012	35.7	34.2	28.0

Landings by Gear

Certain commercial gear types are associated with the retention of spiny dogfish in federal waters. The catch of spiny dogfish by gear from 1996 - 2012 is given in Table 7. In the past five years, spiny dogfish landings came mostly from sink gillnets (71.4%), bottom otter trawls (16.2%), hook and line (12.1%), as well as unknown or other gear (0.3%).

Table 7. Commercial gear types associated with spiny dogfish harvest for calendar years 1996-2011. Note that vessels with state issued permits only are not required to complete VTRs so total VTR landings are less than total dealer-reported landings.

YEAR	GILL NET	TRAWL, BOTTOM	HOOK AND LINE	OTHER*	TOTAL
1996	29,579,961	6,037,302	3,732,568	145,104	39,494,935
1997	24,878,433	4,134,679	3,540,179	97,497	32,650,788
1998	24,794,310	4,892,602	3,413,065	47,220	33,147,197
1999	17,527,898	4,529,311	5,396,759	50,270	27,504,238
2000	6,147,934	5,750,119	4,200,552	15,678	16,114,283
2001	853,473	348,285	2,620,863	2,300	3,824,921
2002	644,303	348,885	808,597	55,631	1,857,416
2003	262,022	121,372	194,133	250	577,777
2004	904,811	339,833	74,693	3,282	1,322,619
2005	1,083,057	531,236	182,620	2,411	1,799,324
2006	2,252,631	1,052,690	373,964	6,472	3,685,757
2007	1,861,738	410,407	341,601	6,219	2,619,965
2008	2,619,441	531,572	336,444	24,114	3,511,571
2009	6,144,699	1,904,194	766,083	22,338	8,837,314
2010	5,892,778	1,533,946	1,225,233	10,004	8,661,961
2011	10,757,661	2,381,889	1,542,412	53,513	14,735,475
2012	12,367,393	1,791,693	3,067,743	29,962	17,256,791
Average pct by gear for latest five years (2008-2012)	71.4%	16.2%	12.1%	0.3%	100.0%

* combined landings which may include unknown, mid-water trawl, beam trawl, seine, pots and traps, and dredge

Landings by Area

The Northeast Region is divided into 46 statistical areas for federal fisheries management (Figure 12). According to VTR data, five statistical areas collectively accounted for 75.0 % of spiny dogfish landings in 2012, with each contributing greater than 5.0 % of the total (Table 8). These areas also represented75.8% of the trips that landed spiny dogfish suggesting that resource availability as expressed by catch per trip is fairly consistent through the range where harvest occurs.

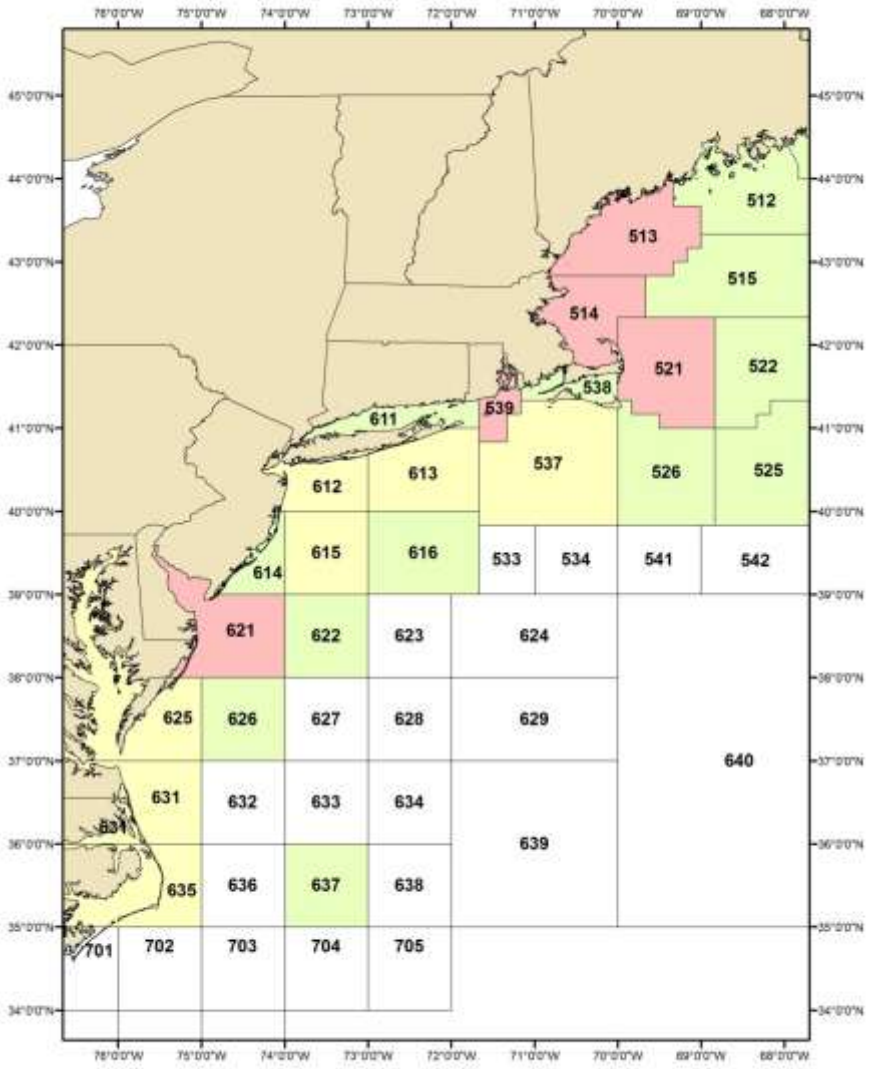

Figure 12. NMFS Northeast statistical areas. Shaded areas indicate where spiny dogfish harvest occurred in 2012. Red areas comprise 5% or more of harvest, yellow areas 1% to 5% of harvest, and green areas less than 1%.

Table 8. Statistical areas that accounted for at least 1 % of the spiny dogfish catch and/or trips in FY2012 VTR data. Shading (red or green) is provided for reference with Figure 10.

STATAREA	Trips	lbs	Pct_Trips	Pct_Lbs
514	3,487	4,684,764	29.1%	27.1%
521	2,262	4,354,554	18.9%	25.2%
513	1,839	1,892,981	15.3%	11.0%
621	559	1,083,718	4.7%	6.3%
539	933	927,956	7.8%	5.4%
631	268	674,602	2.2%	3.9%
615	294	646,755	2.5%	3.7%
612	476	617,641	4.0%	3.6%
537	560	540,071	4.7%	3.1%
625	211	442,140	1.8%	2.6%
635	120	433,391	1.0%	2.5%
613	313	353,403	2.6%	2.0%

Source: Vessel Trip Report database

Canadian Commercial Spiny Dogfish Landings

Historic Canadian commercial landings have been low relative to landings from the U.S. commercial fishery (Table 5). In 2001, following the implementation of the U.S. Federal FMP, Canadian landings exceeded U.S. landings for the first time. In 2008, Canadian landings were about 3.5 M lb, but in 2009 landings dropped precipitously to about 250,000 lb. In 2010, the increased availability of U.S. spiny dogfish continued to constrain demand for Canadian product even though Canada has allowed a directed fishery under a 2,500 mt (5.512 M lb) quota with no trip limits. In 2010 Canadian landings dropped further to 13,000 lb before increasing to 273,000 lb in 2011 and 143,000 lb in 2012 (Table 5).

Recreational Landings

As previously stated, no significant recreational fishery exists for spiny dogfish. Some retention of recreationally caught spiny dogfish does occur, however. Recreational landings by state for 2010 are provided in Table 9 below.

Table 9. Recreational landings (lb) of spiny dogfish by state for 2012.

State	Landings (lb)	Pct of Total
NORTH CAROLINA	16,052	46.43%
SOUTH CAROLINA	7,531	21.78%
NEW JERSEY	4,650	13.45%
DELAWARE	3,521	10.18%
MARYLAND	1,041	3.01%
NEW HAMPSHIRE	977	2.83%
MASSACHUSETTS	443	1.28%
VIRGINIA	359	1.04%
TOTAL	**34,574**	**100.00%**

Source: Marine Recreational Fisheries Statistical Survey Data

6.1.3 Non-Target Species

Discards of non-target species in the directed spiny dogfish fishery are difficult to characterize since defining the directed fishery can be done a number of ways. Gear-specific landings data suggest that catch composition varies among gears and that some gear (e.g., bottom longline) are more likely to produce catches that are predominantly spiny dogfish, while other gear (e.g., bottom trawls) are characterized by a more diverse catch. Discards have been tabulated for observed trips in 2012 where any dogfish were retained and are summarized in Table 10. On gillnet trips, spiny dogfish comprised 59.34% of total observed discards, with other major discard species including winter skate (10.90%) and lobster (9.11%). All other species combined (81 spp) comprised 19.50% of total discards. On observed hook and line trips, a total of 12 species besides spiny dogfish were accounted for in the discards. Spiny dogfish comprised 63.71% of total discards, thorny skate comprised 13.61%, cod 11.47% and no other species comprised more than 5%. On observed trawl trips, unknown fish comprised 47.22% of discards, spiny dogfish 18.54%, and little skate 11.31% with a total of 58 other discard species. .

Table 10. Discards associated with the dominant gear types used to harvest spiny dogfish in 2012 as reported in northeast fisheries observer program (NEFOP) data when spiny dogfish were landed. Species comprising 1% or more of the discards by gear are shown. Stock status for each discard species is also indicated (see below)

Hook and Line			Gill Net, Sink			Trawl, Otter, Bottom		
Discard Species	**Discards (lb)**	**Pct Of Total for this Gear**	**Discard Species**	**Discards (lb)**	**Pct Of Total for this Gear**	**Discard Species**	**Discards (lb)**	**Pct Of Total for this Gear**
DOGFISH, SPINY [a,b]	5,402	63.71%	DOGFISH, SPINY [a,b]	113,381	59.34%	FISH, NK [n/a]	387,873	47.22%
SKATE, THORNY [a,d]	1,154	13.61%	SKATE, WINTER [a,b]	20,829	10.90%	DOGFISH, SPINY [a,b]	152,304	18.54%
COD, ATLANTIC [d,e]	973	11.47%	LOBSTER [a,b]	17,414	9.11%	SKATE, LITTLE [a,b]	92,923	11.31%
SKATE, WINTER [a,b]	262	3.09%	POLLOCK [a,b]	4,489	2.35%	SKATE, WINTER [a,b]	29,157	3.55%
HADDOCK [a,b,e*]	239	2.81%	SKATE, BARNDOOR [a,b]	4,473	2.34%	SKATE, BARNDOOR [a,b]	16,171	1.97%
SKATE, LITTLE [a,b]	205	2.41%	SKATE, LITTLE [a,b]	4,043	2.12%	SKATE, NK [n/a]	11,668	1.42%
WOLFFISH, ATL. [n/a]	122	1.44%	COD, ATLANTIC [d,e]	3,400	1.78%	SKATE, THORNY [a,d]	11,531	1.40%
OTHER (6 sp.)	123	1.46%	SKATE, LITTLE [a,b]	3,294	1.72%	BUTTERFISH [a,b]	10,747	1.31%
			RAVEN, SEA	2,846	1.49%	LOBSTER [a,b]	8,478	1.03%
			OTHER (75 sp.)	16,916	8.85%	OTHER (52 sp.)	100,564	12.24%
Total	**8,479**	**100%**	**Total**	**191,086**	**100%**	**Total**	**821,416**	**100%**

[a] not overfished, [b] overfishing not occurring, [c] overfished vs. not overfished is unknown, [d] overfished, [e] overfishing is occurring, [f] overfishing unknown, [n/a] not applicable, *Overfishing for Gulf of Maine Haddock only

Source: Northeast Fishery Observer Program, 2nd Quarter 2013 NMFS Fish Stock Sustainability Index

6.2 Habitat

This section describes the physical environment, identifies EFH and then addresses the vulnerability of EFH utilized by the managed resource to physical disturbance by fishing and non-fishing activities, as well as the vulnerability of other species' EFH to disturbance by the spiny dogfish fishery.

6.2.1 Physical Environment

A report entitled "Characterization of Fishing Practices and the Marine Benthic Ecosystems of the Northeast U.S. Shelf, and an Evaluation of the Potential Effects of Fishing on Essential Fish Habitat" was developed by NMFS (Stevenson et al. 2004). This document provides additional descriptive information on the physical and biological features of regional subsystems and habitats in the Northeast Shelf Ecosystem. It also includes a description of fishing gears used in the NMFS Northeast region, maps showing the regional distribution of fishing activity by different gear types during 1995-2001, and a summary of gear impact studies published prior to 2002 that indicate how and to what degree fishing practices used in the NMFS Northeast region affect benthic habitats and species managed by the New England and Mid-Atlantic fishery management councils. It is available by request through the NMFS Northeast Regional Office or electronically at: http://www.nefsc.noaa.gov/nefsc/publications.

The Northeast Shelf Ecosystem has been described as the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Sherman et al. 1996). The Gulf of Maine, Georges Bank, and Mid-Atlantic Bight are distinct subsystems within this region.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and fast-moving currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. Pertinent aspects of the physical characteristics of each of these subsystems are described below. The description provided is based on several review documents (Cook 1988; Pacheco 1988; Stumpf and Biggs 1988; Abernathy 1989; Townsend 1992; Mountain et al. 1994; Beardsley et al. 1996; Brooks 1996; Sherman et al. 1996; NEFMC 1998; Steimle et al. 1999).

Gulf of Maine: Although not obvious in appearance, the Gulf of Maine is actually an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotia (Scotian) Shelf, on the west by the New England states and on the south by Cape Cod and Georges Bank. The Gulf of Maine (GOM) was glacially derived, and is characterized by a system of deep basins, moraines and rocky protrusions with limited access to the open ocean. This geomorphology influences complex oceanographic processes which result in a rich biological community.

Topographic highlights of the area include three basins that exceed 800 feet in depth; Jordan to the north, Wilkinson to the west, and Georges just north of Georges Bank. The average depth in the Gulf of Maine is 450 feet. The Gulf of Maine's geologic features, when coupled with the

vertical variation in water properties, result in a great diversity of habitat types (Watling et al. 1988). An in-depth review of GOM habitat types has been prepared by Brown (1993).

Georges Bank: Georges Bank is a shallow (10 to 500 foot depth), elongate (100 miles wide by 200 miles long) extension of the continental shelf formed by the Wisconsinian glacial episode. It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank. It is separated from the rest of the continental shelf to the west by the Great South Channel. The nature of the sea bed sediments varies widely, ranging from clay to gravel (Valentine and Lough 1991). Surficial sediments composed of a gravel-sand mix have been noted as important postlarval habitat for Atlantic cod, haddock, winter flounder, yellowtail flounder and other species. American plaice adults have been demonstrated to associate with gravel-sand sediments for a variety of potential reasons. Gravel-sand sediments have been noted as habitat for sea scallops, where movement of sand is relatively minor (Langton and Uzmann 1990; Valentine and Lough 1991). The gravel-sand mixture is usually a transition zone between coarse gravel and finer sediments.

Georges Bank is characterized by high levels of primary productivity, and historically, high levels of fish production. It has a diverse biological community that is influenced by many environmental conditions. Several studies have attempted to identify demersal fish assemblages over large spatial scales on Georges Bank. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and Gulf of Maine that were persistent temporally and spatially. Depth and salinity were identified as major physical influences explaining assemblage structure.

Mid-Atlantic Bight*:* The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream. Like the rest of the continental shelf, the Mid-Atlantic Bight was shaped largely by sea level fluctuations caused by past ice ages. The shelf's basic morphology and sediments are derived from the retreat of the last ice sheet, and the subsequent rise in sea level. Since that time, currents and waves have modified this basic structure.

The shelf slopes gently from shore out to between 75 and 150 miles offshore where it transforms to the slope (300 to 600 ft water depth) at the shelf break. In both the Mid-Atlantic and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself. The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales.

The sediment type covering most of the shelf in the Mid-Atlantic Bight is sand, with some relatively small, localized areas of sand-shell and sand-gravel. On the slope, silty sand, silt, and clay predominate. Sand provides suitable habitat properties for a variety of fishes, invertebrates, and microorganisms. Invertebrates, such as surfclams, razor clams, and ocean quahogs, burrow between the grains to support their characteristic sessile behavior. Dunes and ridges provide refuge from currents and predators and habitat for ambush predators. Several species inhabit sand habitats (e.g. amphipods, polychaetes) that are important prey for flounder. Yellowtail and winter flounder distribution has been correlated to sand (Langton and Uzmann 1990). In general, flatfish are more closely associated with sand and finer sediments than are other demersal fishes.

Canyons occur near the shelf break along Georges Bank and the Mid-Atlantic Bight, cutting into the slope and occasionally up into the shelf as well. They exhibit a more diverse fauna,

topography, and hydrography than the surrounding shelf and slope environments. The relative biological richness of canyons is in part due to the diversity of substrate types found in the canyons, and the greater abundance of organic matter.

Faunal assemblages were described at a broad geographic scale for Mid-Atlantic Bight continental shelf demersal fishes, based on NMFS bottom trawl survey data between 1967 and 1976 (Colvocoresses and Musick 1983). There were clear variations in species abundance, yet they demonstrated consistent patterns of community composition and distribution among demersal fishes of the Mid-Atlantic shelf. The boundaries between fish assemblages generally followed isotherms and isobaths.

Coastal Features

Coastal and estuarine features in the Northeast Shelf Ecosystem include salt marshes, mud flats, intertidal zones, and submerged aquatic vegetation, all of which provide critical to habitats for inshore and offshore fishery resources. Coastal areas and estuaries are important for nutrient recycling and primary productivity, and many economically important finfish and shellfish species use these as spawning areas and nurseries for juvenile life stages.

Rocky intertidal zones are periodically submerged, high energy environments found in the northern portion of the Northeast system. Specially adapted residents may include sessile invertebrates, finfish species, and algae, e.g., kelp and rockweed (which also function as habitat). Fishery resources may depend upon particular habitat features of the rocky intertidal zones that provide specific prey items and refuge from predators. Sandy beaches are most extensive along the Northeast coast. Different zones of the beach present habitat conditions ideal for a variety of marine and terrestrial organisms. For example, the intertidal zone is suitable habitat for many invertebrates and transient fish which forage in these areas during high tide. Several invertebrate and fish species are adapted for living in the high energy subtidal zone adjacent to sandy beaches.

Dump Sites

The Council has been requested via previous public comments to include mention that numerous old dump sites for municipal and industrial waste exist in the management area, specifically the "106-Mile Dump Site" formerly utilized east of Delaware's ocean coastline, beyond the Continental Shelf. Detailed information on the 106-Mile Dump Site can be found in the 1995 EPA report to Congress on the 106-Mile Dump Site available at: http://www.epa.gov/adminweb/history/topics/mprsa/Monitoring,%20Research%20and%20Surveillance%20of%20the%20106%20Mile%20Deepw.pdf . It generally concluded that sewage sludge and/or related contaminants did not reach important areas for commercial fisheries and that the 106-Mile Dump Site was not the prime source of the generally low chemical contamination in tilefish, the primary commercially important finfish species resident in the shelf/slope areas adjacent to the 106-Mile Dump Site (EPA 1995).

6.2.2 Fishing Effects on Essential Fish Habitat

The EFH Final Rule (50 CFR Part 600.815(a)(2)(i) and (ii)), requires that FMPs must evaluate the potential adverse effects of fishing on EFH designated under the FMP, including the effects of each fishing activity regulated under the FMPor other Federal FMPs and, if necessary, minimize to the extent practicable adverse effects from fishing on EFH, including EFH designated under other Federal FMPs. The Final Rule directs the Councils to act to prevent, mitigate, or minimize any adverse effects from fishing, to the extent practicable, if there is evidence that a fishing activity adversely affects EFH in a manner that is more than minimal and not temporary in nature, based on the results of the adverse effects evaluation.

As applied to the spiny dogfish fishery, this evaluation should consider the effects of each type of fishing activity occurring in the directed dogfish fishery on dogfish EFH as well as on EFH for species managed in other FMPs. It should also include an evaluation of the effects of gears used in other federally-managed and non-MSA fisheries on spiny dogfish EFH. It should develop conclusions as to whether EFH is being impacted, and if so how it is being impacted, based on examination of the distribution of fishing effort and all relevant information on the subject. The evaluation should also consider the cumulative effects of multiple fishing activities on EFH. The evaluation provided in this section satisfies these requirements.

This fishing effects evaluation up-dates and replaces the original one done in the 1999 spiny dogfish FMP and in a supplement to the FMP (MAFMC 1999a and b). It accounts for any changes that have occurred in the fishery since the original evaluation was done and incorporates any new information relating to the potential effects of the fishery on EFH that has become available during the past 15 years. The baseline fishing effects evaluation concluded that the three principal gears used to harvest spiny dogfish – bottom trawls, longlines, and gill nets – all have the potential to adversely affect spiny dogfish EFH, but until there is evidence showing that they, in fact, do have a negative impact on spiny dogfish EFH, no management measure were needed to minimize the effects of the fishery on EFH. The evaluation did not address the effects of the dogfish fishery on EFH for any other federally-managed species in the region.

The management of many different fisheries within the Northeast region falls within the jurisdiction of the New England and Mid-Atlantic Fishery Management Councils, as well as individual states from Maine through North Carolina under the jurisdiction of the Atlantic States Marine Fisheries Commission. Therefore all gear types within this region are considered in this evaluation. Of those gears identified by Stephan et al. (2000), 42 are known to contact the seabed, and hence potentially directly affect EFH. Descriptions of the primary types of fixed and mobile bottom-tending gears, and of a number of pelagic fishing gaers, used in the region can be found in a report by Stevenson et al. (2004). This publication is also available on line at http://www.nefsc.noaa.gov/publications/tm/tm181.

Because spiny dogfish are frequently caught incidentally in fishing gear being used to target other species, a necessary first step is to determine which gears are used in the directed fishery for spiny dogfish. This was done by calculating the percentage of landings from trips where spiny dogfish were captured by gear using vessel trip report data from 1996 - 2012 (Table 7). Vessel trip reports are required for all federally permitted vessels, whether they are fishing in Federal or state waters. Information on the distribution of landings by gear for vessels fishing exclusively in state waters is unavailable. It is unlikely, however, that the gears used to land spiny dogfish in state waters would differ from those used exclusively in Federal waters, or fishing in both state and Federal waters.

Directed Spiny Dogfish Fishery

Low-level commercial landings of spiny dogfish were driven by activity in other fisheries during the stock rebuilding period (fishing years 2000 – 2008) when quotas (4.0 M lb) and trip limits (400 – 600 lb) were designed to allow primarily for the retention of incidentally caught spiny dogfish. Beginning in 2009, however, increases in the annual quota (>12 M lb; see Table 6) and the commercial trip limit (3,000 lb) made directing on spiny dogfish in federal waters more likely.

The degree of directing fishing occurs would be expected to vary by gear. To determine the relative importance of directing among commercial gear types, the percentage of total annual landings by gear was initially evaluated based on a comparison of trip-level landings to total annual landings. Annual landings by gear as a function of proportional trip-level landings were examined using federal vessel trip report (VTR) data from 2009 –2012. Figure 11 illustrates the results of this exercise for the three major gear-types associated with spiny dogfish landings (bottom longline, sink gillnet, and bottom otter trawl).

Differences among gear types are evident. The greatest percentage of trip level dogfish landings was in the bottom longline gear category where nearly all bottom longline landings came from trips where spiny dogfish comprised more than 90% of trip-level landings (Figure 13). For sink gillnets the bulk of landings (>50%) were achieved from trips where spiny dogfish comprised more than 70% of trip-level landings suggesting that mixed species trips were more common for gillnet gear than for longline gear (Figure 13). For bottom otter trawls, total landings and percent trip level landings were fairly linear such that the proportion of spiny dogfish in trip level landings was evenly distributed suggesting that directing is the least common with this gear type.

Table 11 further illustrates this issue and also provides the number of trips associated with the different gear types. Note that since in the recent (2009 fwd) timeframe, the average percentage of trip level landings comprised by spiny dogfish is above 90% for longline gear, approximately 60% for gillnets, and about 30% for trawl gear. However, the number of trips is far greater in the gillnet category suggesting that this is the primary gear for the dogfish fishery. Clearly a smaller, but more highly directed fishery exists using longline gear, and finally, the trawl fishery is most likely a primarily mixed-species fishery. The degree to which directed fishing is occurring becomes important in the analysis gear-specific impacts on habitat and non-target species including protected resources.

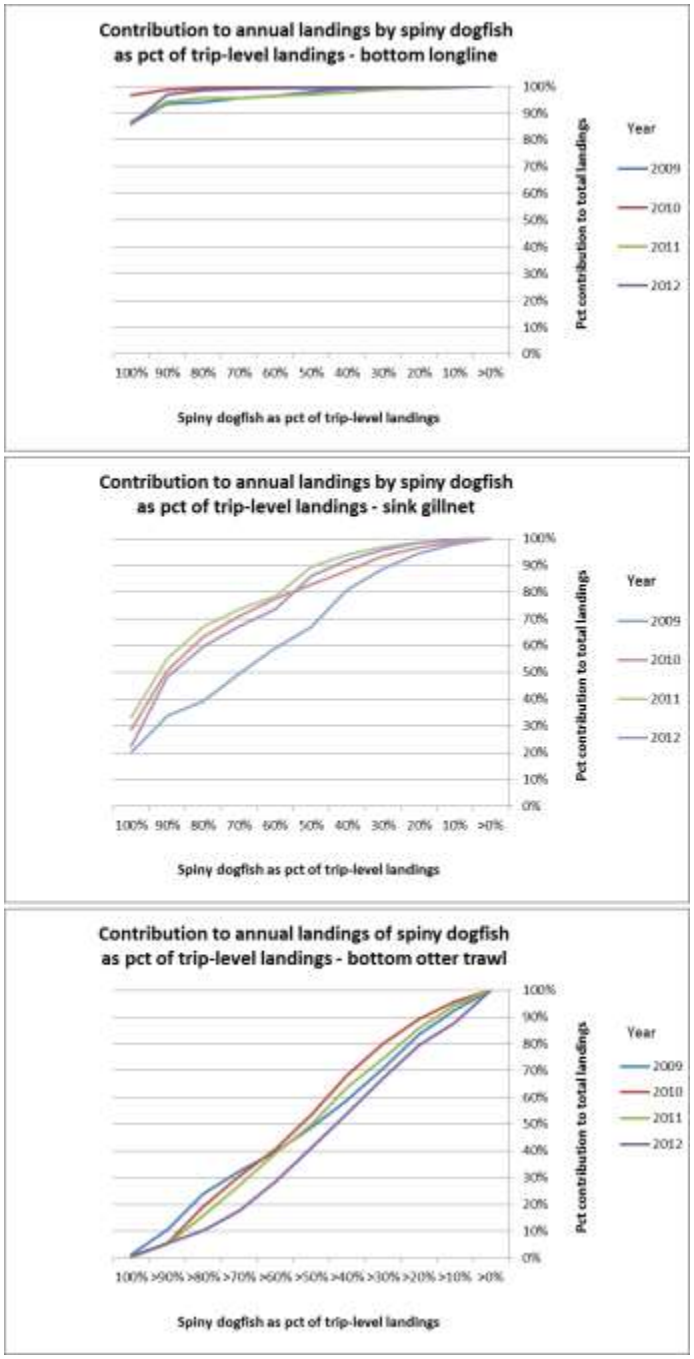

Figure 13. Total annual landing of spiny dogfish as a function of proportional trip-level landings by gear type. Source: Vessel trip report database. Note: As of the submission of this document, there were no gillnet landings reported in the VTR database for 2010.

Table 11. Number of trips and average trip landings of spiny dogfish in lbs and as a pct of trip landings for longline, gillnet, and trawl gear in 2000-partial year 2013.

Year	Longline			Gillnet			Trawl			Federal Trip Limt
	Ave dog lbs	Ave dog pct	N_Trips	Ave dog lbs	Ave dog pct	N_Trips	Ave dog lbs	Ave dog pct	N_Trips	
2000	5,629	95.0%	706	1,477	35.9%	3,541	3,350	30.1%	1,414	n/a
2001	5,764	97.7%	437	812	25.6%	1,036	640	20.2%	531	400-600
2002	5,291	99.1%	140	1,034	33.3%	594	984	22.0%	352	400-600
2003	6,544	100.0%	23	2,091	48.4%	124	512	13.2%	235	400-600
2004	462	36.2%	87	469	27.5%	1,913	362	24.8%	925	400-600
2005	442	47.2%	229	374	24.9%	2,882	345	25.3%	1,527	400-600
2006	1,034	64.3%	273	492	29.3%	4,505	390	25.3%	2,642	400-600
2007	1,644	83.2%	126	675	33.8%	2,560	414	21.8%	981	400-600
2008	1,480	94.2%	165	715	38.9%	3,534	401	22.2%	1,307	400-600
2009	1,559	93.8%	393	1,061	43.4%	5,488	926	28.5%	2,040	3,000
2010	2,588	98.7%	399	1,701	60.2%	3,394	1,347	34.9%	1,129	3,000
2011	2,309	90.3%	505	2,047	67.7%	5,213	1,495	36.2%	1,772	3,000
2012	2,694	93.0%	861	1,977	65.2%	6,090	1,203	30.6%	1,483	3,000
partial 2013	3,705	94.3%	329	2,596	68.3%	2,574	1,321	27.9%	848	4,000
09-12 Ave	2,287	94.0%	540	1,696	59.1%	5,046	1,243	32.6%	1,606	

General Impacts of Fishing on Habitat

The effects of fishing gear on habitat have been addressed in a number of scientific reviews, with several types of gear effects being identified including the alteration of physical structure, sediment suspension, chemical modification, change to benthic community, and ecosystem effects (McAllister 1991; ICES 1992; Jennings and Kaiser 1998; Auster and Langton 1999; Blaber et al. 2000; Collie et al. 2000). These studies suggest it is important to consider the long-term and short-term effects of fishing gear on the environment.

Fishing gear can impact the physical structure of habitat by scraping, ploughing, burying mounds, smoothing sand ripples, removing stones, dragging and turning boulders, eliminating structure providing taxa, and eliminating or damaging submerged aquatic vegetation (Fonseca et al. 1984; Messieh et al. 1991; Black and Parry 1994; Gordon et al. 1998; Kaiser et al. 1998; Lindeboom and deGroot 1998; Schwinghamer et al. 1998; Auster and Langton 1999; Kaiser et al. 1999; Ardizzone et al. 2000). Physical alterations may reduce the heterogeneity of the sediment surface, alter sediment texture, and reduce the structured habitat available to biota. The magnitude and duration of physical alteration varies with fishing gear types and habitat or sediment types.

Sediment suspension (turbidity), which occurs as fishing gears are dragged across the bottom, can cause reduced light penetration in the water column, smother benthic species and spawning areas, and negatively effects feeding and metabolic rates of organisms. It can also affect regional nutrient budgets by burying fresh organic matter or exposing deep anaerobic sediments. Re-suspension over a large enough area can actually cause large scale redistribution of sediments (Messieh et al. 1991; Black and Parry 1994). In addition, species reaction to turbidity depends on life history characteristics of the species. Mobile organisms can move out of the affected area and quickly return once the disturbance dissipates (Simenstad 1990; Coen 1995), while sessile benthic organisms cannot. Even if species experience high mortality within the affected area, those with short life history stages, high levels of recruitment, and high mobility can repopulate the affected area quickly. However, if effects are protracted and occur over a large area, recovery through recruitment or immigration may be hampered. Furthermore, chronic resuspension of sediments may lead to shifts in species composition, by favoring rapid colonists or those that can take advantage of the pulsed nutrient supply released from the seafloor to the euphotic zone (Churchill 1989).

Alteration of the chemical composition of both the sediments and overlying water mass can occur through mixing of sediments with overlaying waters. In shallow water this mixing might be insignificant relative to tides, storm surge, and wave action, but in deeper, stable waters this mixing can have significant effects (Rumohr 1989). It remains unclear how the alteration of sediment and water chemistry may impact fish populations. When nutrients supplies are low, the effective mixing of sediments could cause increased phytoplankton primary productivity and/or eutrophication (Rjinsdorp and Van Leeuwen 1996). Alternatively, ICES (1992) concluded pulses of nutrients are compensated by lower fluxes after the trawl has passed, and nutrient releases due to fishing gear activity that simply recycle existing nutrients are probably less influential than new inputs, such as from rivers and land runoff (ICES 1992).

Fishing impacts on benthic species depend on life history, ecology and physical characteristics of the species in question (Bergman and Van Santbrink 2000). Mobile species that exhibit high fecundity and rapid generation time will recover more quickly than sessile, slow-growing

species. Species such as mollusks and crustaceans are also vulnerable to bottom-tending gear impacts because of potential damage to their hard parts. Thin shelled bivalves and starfish show higher damage than solid-shelled bivalves in fished areas (Rumohr and Krost 1991). Species which retract into the sediments or reside below the penetration depth of the fishing gear will typically sustain less damage than epibenthic organisms. Species that are more elastic (flexible) will suffer much less damage than those that are hard and inflexible (Eno et al. 2001).

Increased fishing pressure can also lead to redistribution of species, either away from or towards the fished area (Kaiser and Spencer 1994, 1996; Ramsay et al. 1996; Kaiser and Ramsay 1997; Morgan et al. 1997; Ramsay et al. 1998; Bradshaw et al. 2000; Demestre et al. 2000). Opportunistic feeders may, however, be attracted to areas disturbed by mobile fishing gear (Kaiser and Spencer 1994; Frid and Hall 1999).

The roles the alterations of physical structure, sediment suspension, chemical modifications, and changes to benthic community have on the production of many important finfish species is in many cases unknown. However, increasing empirical observations and modeling suggests that effects can indeed be seen in population responses. The data on this subject are somewhat limited and therefore in 2002, at the request of NMFS, the National Research Council evaluated the effects of trawling and dredging on seafloor habitats (NRC 2002). This NRC report provides a series of recommendations to improve our understanding of the effects of fishing on benthic habitats.

While many of the studies described throughout this section focus on specific aspects of gear impacts on seafloor habitats, most agree that there is some alteration of habitat, which in many cases are negative. It remains important to consider the long-term and short-term effects of fishing gear on structural components of habitat, community structure, and ecosystem processes, as well as the implications of these effects for management (Auster and Langton 1999).

Gear-Specific Impacts on Habitat

The report entitled "Characterization of Fishing Practices and the Marine Benthic Ecosystems of the Northeast U.S. Shelf, and an Evaluation of the Potential Effects of Fishing on Essential Fish Habitat" (Stevenson et al. 2004) reviews the impacts of specific fishing gear utilized within the Northeast region, and their potential impacts on marine habitat types typical of the Northeast Shelf Ecosystem. The following paragraphs interpret the findings of this report as they apply to the fishing gears that contact the bottom habitat and are used in the spiny dogfish fishery.

Gillnets and Bottom Longlines

According to Stevenson et al. (2004), the vulnerability of all EFH for all benthic species and life stages to sink gill net and bottom longline usage was considered to be low. It is therefore concluded, for the use of these gear types by the spiny dogfish fishery, where these gear types comprise approximately 83% of landings, is associated with low impacts to EFH of any species. It is further concluded, based on this, that no further management measures are needed to minimize gear impacts to EFH from these gear types.

Bottom Otter Trawls

In studies examining the effect of bottom otter trawling on a variety of substrate types, it was demonstrated that the physical effects of trawl doors contacting the bottom produced furrows and some shifts in surface sediment composition, although there is a large variation in the duration of these impacts. Typically the more dynamic environment and less structured bottom composition, the shorter the duration of impact. This type of fishing was demonstrated to have some effects on composition and biomass of benthic species in the affected areas, but the directionality and duration of these effects varied by study and substrate types. Studies conducted examining the effects of traps and pots in a variety of mixed substrates concluded that while attached epibenthic megafauna were bent over or up-rooted when pots were fished or dragged over mud sediments, the effects were short term and did not appear to affect the abundance of attached benthic epifauna.

For the spiny dogfish fishery, it has been stated repeatedly in annual specifications and also demonstrated above, that minimal directed fishing occurs using bottom otter trawls. In other words landings by vessels using bottom otter trawl gear are a relatively minor component of the directed spiny dogfish fishery and spiny dogfish are a small component of the overall trawl fishery. It is therefore concluded that no additional management measures are needed to minimize gear impacts from this gear type.

Non-Fishing Effects on Essential Fish Habitat

Habitat alteration and disturbance occur from natural processes and human activities. Deegan and Buchsbaum (2005) placed human impacts to marine habitats into three categories: (1) permanent loss; (2) degradation; and (3) periodic disturbance. Permanent loss of habitat can result from activities such as wetland filling, coastal development, harbor dredging, and offshore mining operations (Robinson and Pederson 2005). Habitat degradation may be caused by physical changes, such as increased suspended sediment loading, overshadowing from new piers and wharves, as well as introduction of chemical contamination from land-based human activities (Robinson and Pederson 2005). Periodic disturbances are created by activities such as trawling and dredging for fish and shellfish and maintenance dredging of navigation channels.

The primary differences between these three categories are that permanent loss is irreversible, habitat degradation may or may not be reversible, and periodic disturbance is generally reversible once the source of disturbance is removed (Deegan and Buchsbaum 2005). These authors indicate that recovery times for degraded habitat depend on the nature of the agent causing the degradation and the physical characteristics of the habitat. Recovery times for periodic disturbances will vary depending on the intensity and periodicity of the disturbance and the nature of the habitat itself. Natural fluctuations in habitats, such as storms and long-term climatic changes, occur independently of anthropogenic impacts.

Deegan and Buchsbaum (2005) state that "habitat quantity is a measure of the total area available, while habitat quality is a measure of the carrying capacity of an existing habitat." Generally, activities that lead to a permanent loss of habitat reduce the quantity of habitat, whereas habitat degradation and periodic disturbances result in a loss of habitat quality. The reduced quality of habitat (e.g., siltation, eutrophication, and alteration of salinity and food webs) may be equally damaging to the biological community as a loss in habitat quantity. As Deegan and Buchsbaum (2005) have noted, "the physical structure of the habitat does not need to be

directly altered for negative consequences to occur." For example, reductions in water quality can impair and limit the ability of aquatic organisms to grow, feed, and reproduce.

The end point of gradual declines in the quality of habitat can be the complete loss of habitat structure and function (Deegan and Buchsbaum 2005). Losses of habitat quantity and quality may reduce the ability of a region to support healthy and productive fish populations. From the population perspective, the loss of habitat quantity and quality creates stresses on a population. Populations that are stressed by one or more factors can be more susceptible to stresses caused by other factors (Robinson and Pederson 2005), resulting in cumulative effects. These authors call for a holistic approach to fishery management: one that considers the interactions among exploitation, contaminants, and habitat degradation on various fish stocks.

6.2.3.5 Potential impacts to spiny dogfish EFH from non-fishing activities

Johnson et al. (2008) identified non-fishing activities and effects that are known or suspected to have adverse impacts on fisheries habitat. While many of these activities and effects clearly have direct, adverse impacts on the quantity and quality of fisheries habitat, their effects at the population and ecosystem level are generally poorly understood or unknown. Based on the EFH descriptions (see Section 5.2), those non-fishing activities that occur in pelagic marine/offshore habitats have the greatest potential to adversely impact EFH for spiny dogfish. Non-fishing activities that were identified as potentially having high impacts on pelagic offshore marine habitats in the Northeast region are listed by type of activity and effect in the following table. Activities and potential effects that would be most likely to adversely affect spiny dogfish EFH are highlighted in bold type. Some activities with high potential effects (e.g., fish waste disposal, sewage discharge) are not likely to be significant because they do not occur very often, are very localized, or are mostly limited to nearshore waters where dogfish are not very common.

Type of Activity	Potential Effect
Petroleum exploration, production, and transportation	Oil spills
Liquefied natural gas	Discharge of contaminants
Offshore wind energy facilities	Underwater noise
Petroleum extraction	Contaminant releases
	Drilling mud impacts
Fish waste disposal	Introduction of pathogens
	Release of nutrients/eutrophication
Sewage discharge facilities	Release of nutrients/eutrophication
	Release of contaminants
Combined sewer overflows	Variety of effects on water quality
Water intake facilities	Entrainment/impingement
Climate change	Alteration of hydrological regimes
	Alteration of temperature regimes
	Alteration of weather patterns
	Changes in community structure
Ocean noise	Mechanical injury to organisms
Atmospheric deposition	Mercury loading/bioaccumulation
Military/security activities	Noise impacts

The threats most likely to have significant negative effects on spiny dogfish EFH would probably be caused by oil spills, climate change, and the bioaccumulation of mercury and other contaminants that are present in prey organisms and accumulated in the food chain. As an example, the fishery for dogfish was severely reduced in 2013 when the European Union placed an embargo on imports of dogfish from the U.S. with PCB levels that exceeded the maximum allowable concentration level.

Oil spills affect all ecosystems and life history stages, and oil spills have a high potential for adverse effects to coastal ecosystems in the northeast region of the U.S. Currently, there are no petroleum exploration or production activities along the east coast of the U.S. Should petroleum exploration and production be proposed in the northeast region, considerable work would likely be necessary to assess the potential effects these activities may have on pelagic marine ecosystems.

Conclusion
There is no direct evidence for which of the above mentioned impacts may have the greatest potential to adversely impact Spiny Dogfish EFH. That said, discussions by NERO Habitat Staff and MAFMC Council staff developed a short list of activities that preliminarily could be of concern. They include:

-Activities that could involve risk of large-scale oil spills such as oil extraction and transportation.
-Activities that could lead to large scale temperature changes such as open-loop LNG facilities.
-Activities that could cause large scale bottom disturbances such as mineral mining and waste/dredge spoils disposal.

In terms of conservation recommendations, the Council recommends collaborative efforts by all responsible parties to mitigate any negative effects for the above types of activities and recommends further research to identify which of the above activities, or other non-fishing activities, could pose the most risk to habitats utilized by spiny dogfish.

6.2.3.6 Habitat Requirements by Life History Stage

The following information on juveniles and adult dogfish habitat requirements was taken directly from the document "Essential Fish Habitat Source Document: Spiny Dogfish, *Squalus acanthias*, Life History and Habitat Characteristics, Second Edition" (Stehlik 2007). The document is referred to hereafter as the EFH source document.

Juvenile Habitat: During spring, juveniles were captured from 3-17°C; most were found between about 6-13°C. They were captured at depths between 11-500 m, with the majority found below 50 m. They were found in a salinity range of about 24-36 ppt, with the majority between 33-35 ppt. During the autumn, the juveniles were found over a temperature range of 5-18°C; most were found at about 8-14°C. Their depth range during that season was from 11-400 m; most were found below 40 m. They were found in a salinity range of 31-36 ppt, with the majority between 32-34 ppt.

During the spring they were found in waters with bottom temperatures of 2-14°C; most were found from 6-11°C, with a large peak in catch at 7°C. Their depth range was from 6-75 m, with the majority found at < 36 m. During the autumn, they were found over a temperature range of 3-21°C. Their temperature distribution was somewhat bimodal, with one peak from about 6-11°C and a smaller peak between 12-15°C. Their autumn depth ranged from 6-85 m, with the majority between 16-45 m.

Adult Habitat: During the spring adult spiny dogfish were found over a temperature range of 3-14°C; most were found from 6-10°C. They were spread over a depth range between 1-500 m. They were found in a salinity range of 29-36 ppt, with the highest catches and occurrences, relative to the trawls, at 34-35 ppt. During the autumn, they were found over a temperature range of 5-18°C, with the majority between 6-16°C. Their autumn depth ranged from 11-400 m, with some higher catches between 21-40 m. They were found over a salinity range of 30-35 ppt, with the majority between 32-34 ppt.

In the spring they were found in waters with bottom temperatures of 1- 16°C; most were found from 6-11°C. Their depth range was from 11 m to about 85 m, with the majority found from about 16-50 m. During the fall they were found over a temperature range of 5-20°C, with most from about 6-15°C. They were spread over a depth range of 6-85 m, with the majority < 65 m.

Most spiny dogfish observed from spring through fall were found in the Eastern Basin of Long Island Sound in depths > 27 m over sand and transitional bottom. Of 553 spiny dogfish caught from April to August, only eight were caught in depths < 18 m (Gottschall et al. 2000). They were also found in deep water across the Mattituck Sill in the Central Basin, but their occurrence decreased from east to west. In late fall, as their overall abundance increased, their abundance was similar on mud and transition bottoms, but they were less abundant on sand. Abundance generally increased with depth, but most spiny dogfish were taken in depths > 18 m (90% of total catch), with the largest catches occurring > 27 m (Gottschall et al. 2000).

In the Hudson-Raritan Estuary trawl survey, spiny dogfish were caught from the months of November through January at bottom depths of 13-20 m, at bottom water temperatures between 7.1-11.3°C, at bottom dissolved oxygen levels between 8.2-11.2 mg/L, and at bottom salinities between 30.7-32.2 ppt (NOAA/NMFS/NEFSC, James J. Howard Marine Sciences Laboratory, Highlands, NJ, unpublished data). The catch locations were in areas of silt, mud, and occasional sand and gravel.

In Chesapeake Bay and tributaries from the 1988-1999 VIMS trawl surveys, spiny dogfish adults were found in colder waters (< 12ºC), and prefer saltier waters of the Bay mouth (> 22 ppt) at depths > 6 m (Geer 2002). They were also found in areas of high dissolved oxygen (> 7.5 mg/l) (Geer 2002).

Current EFH Definitions:

Juveniles:
1) North of Cape Hatteras, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where juvenile dogfish were collected in the NEFSC trawl surveys.

2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft.
3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts.
Generally, juvenile dogfish are found at depths of 33 to1,280 ft in water temperatures ranging between 37˚F and 82˚F.

Adults:
1) North of Cape Hatteras, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where adult dogfish were collected in the NEFSC trawl surveys.
2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1476 ft.
3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts.
Generally, adult dogfish are found at depths of 33 to 1,476 ft in water temperatures ranging between 37˚F and 82˚F.

An electronic version of the EFH source document is available at the following website: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

6.3 ESA LISTED SPECIES AND MMPA PROTECTED SPECIES

There are numerous species that inhabit the environment within the Spiny Dogfish FMP management unit, and that therefore potentially occur in the operations area of the spiny dogfish fisheries, that are afforded protection under the Endangered Species Act of 1973 (ESA; i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA), and are under NMFS' jurisdiction. Seventeen species are classified as endangered or threatened under the ESA, three others are candidate species under the ESA, while the remainder is protected by the provisions of the MMPA.

6.3.1 Species Present in the Area

Table 11 lists the species, protected either by the ESA, the MMPA, or both, that may be found in the environment that would be utilized by the fishery. Table 11 also includes three candidate fish species as identified under the ESA. Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the Federal Register.

Table 12. Species protected under the Endangered Species Act and Marine Mammal Protection Act that may occur in the operations area for the spiny dogfish fishery.

Species	Common name	Scientific Name	Status
Whales	Northern right	*Eubalaena glacialis*	Endangered
	Humpback	*Megaptera novaeangliae*	Endangered
	Fin	*Balaenoptera physalus*	Endangered
	Blue	*Balaenoptera musculus*	Endangered
	Sei	*Balaenoptera borealis*	Endangered
	Sperm	*Physeter macrocephalus*	Endangered
Sea Turtles	Leatherback	*Dermochelys coriacea*	Endangered
	Kemp's ridley	*Lepidochelys kempii*	Endangered
	Green[9]	*Chelonia mydas*	Threatened
	Hawksbill	*Eretmochelys imbricata*	Endangered
	Loggerhead[10]	*Caretta caretta*	Threatened
Fishes	Shortnose sturgeon	*Acipenser brevirostrum*	Endangered
	Atlantic salmon	*Salmo salar*	Endangered
	Smalltooth sawfish	*Pristis pectinata*	Endangered
	Atlantic sturgeon[11]	*Acipenser oxyrinchus*	Endangered; Threatened
	Cusk	*Brosme brosme*	Candidate
	Scalloped hammerhead	*Sphyrna lewini*	Candidate

Candidate species receive no substantive or procedural protection under the ESA; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed project. NMFS has initiated review of recent stock assessments, bycatch information, and other information for these candidate and proposed species. The results of those efforts are needed to accurately characterize recent interactions between fisheries and the candidate/proposed species in the context of stock sizes. Any conservation measures deemed appropriate for these species will follow the information reviews. Please note that once a species is proposed for listing the conference provisions of the ESA apply (see 50 CFR 402.10).

6.3.2 Species Potentially Affected by the Spiny Dogfish Fishery

[9] Florida & Mexico's Pacific coast breeding populations are endangered; populations in all other areas listed as threatened.

[10] Northwest Atlantic distinct population segment (DPS) of loggerhead turtles.

[11] The Gulf of Maine DPS is listed as threatened, while the New York Bight, Chesapeake Bay, Carolina, and South Atlantic populations are listed as endangered.

The spiny dogfish fishery has the potential to affect the sea turtle, cetacean, and pinniped species discussed below. A number of documents contain background information on the range-wide status of sea turtle and marine mammal species that occur in the area and are known or suspected of interacting with fishing gear (demersal gear including trawls, gillnets, and bottom longlines). These documents include sea turtle status reviews and biological reports (NMFS and USFWS 1995; Turtle Expert Working Group 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b, recovery plans for ESA-listed cetaceans and sea turtles (NMFS 1991, 2005; NMFS and USFWS 1991a, 1991b; NMFS and USFWS 1992), the marine mammal stock assessment reports (e.g., Waring et al. 1995---2011), and other publications (e.g., Clapham et al. 1999, Perry et al. 1999, Best et al. 2001, Perrin et al. 2002).

6.3.2.1 Sea Turtles

Loggerhead, leatherback, Kemp's ridley, and green sea turtles occur seasonally in southern New England and Mid-Atlantic continental shelf waters north of Cape Hatteras, North Carolina. Turtles generally move up the coast from southern wintering areas as water temperatures warm in the spring (James et al. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). A reversal of this trend occurs in the fall when water temperatures cool. Turtles pass Cape Hatteras by December and return to more southern waters for the winter (James et al. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). Hard-shelled species typically occur as far north as Cape Cod whereas the more cold-tolerant leatherbacks occur in more northern Gulf of Maine waters in the summer and fall (Shoop and Kenney 1992, STSSN database http://www.sefsc.noaa.gov/seaturtleSTSSN.jsp).

On March 16, 2010, NMFS and USFWS published a proposed rule (75 FR 12598) to divide the worldwide population of loggerhead sea turtles into nine DPSs, as described in the 2009 Status Review. Two of the DPSs were proposed to be listed as threatened and seven of the DPSs, including the Northwest Atlantic Ocean DPS, were proposed to be listed as endangered. NMFS and the USFWS accepted comments on the proposed rule through September 13, 2010 (June 2, 2010, 75 FR 30769). On March 22, 2011 (76 FR 15932), NMFS and USFWS extended the date by which a final determination on the listing action will be made to no later than September 16, 2011. This action was taken to address the interpretation of the existing data on status and trends and its relevance to the assessment of risk of extinction for the Northwest Atlantic Ocean DPS, as well as the magnitude and immediacy of the fisheries bycatch threat and measures to reduce this threat. New information or analyses to help clarify these issues were requested by April 11, 2011.

On September 22, 2011, NMFS and USFWS issued a final rule (76 FR 58868), determining that the loggerhead sea turtle is composed of nine DPSs (as defined in Conant et al., 2009) that constitute species that may be listed as threatened or endangered under the ESA. Five DPSs were listed as endangered (North Pacific Ocean, South Pacific Ocean, North Indian Ocean, Northeast Atlantic Ocean, and Mediterranean Sea), and four DPSs were listed as threatened (Northwest Atlantic Ocean, South Atlantic Ocean, Southeast Indo-Pacific Ocean, and Southwest Indian Ocean). Note that the Northwest Atlantic Ocean (NWA) DPS and the Southeast Indo-Pacific Ocean DPS were original proposed as endangered. The NWA DPS was determined to be threatened based on review of nesting data available after the proposed rule was published, information provided in public comments on the proposed rule, and further discussions within the agencies. The two primary factors considered were population abundance and population trend. NMFS and USFWS found that an endangered status for the NWA DPS was not warranted

given the large size of the nesting population, the overall nesting population remains widespread, the trend for the nesting population appears to be stabilizing, and substantial conservation efforts are underway to address threats.

The September 2011 final rule also noted that critical habitat for the two DPSs occurring within the U.S. (NWA DPS and North Pacific DPS) will be designated in a future rulemaking. Information from the public related to the identification of critical habitat, essential physical or biological features for this species, and other relevant impacts of a critical habitat designation was solicited.

This proposed action only occurs in the Atlantic Ocean. As noted in Conant et al. (2009), the range of the four DPSs occurring in the Atlantic Ocean are as follows: NWA DPS – north of the equator, south of 60° N latitude, and west of 40° W longitude; Northeast Atlantic Ocean (NEA) DPS – north of the equator, south of 60° N latitude, east of 40° W longitude, and west of 5° 36' W longitude; South Atlantic DPS – south of the equator, north of 60° S latitude, west of 20° E longitude, and east of 60° W longitude; Mediterranean DPS – the Mediterranean Sea east of 5° 36' W longitude. These boundaries were determined based on oceanographic features, loggerhead sightings, thermal tolerance, fishery bycatch data, and information on loggerhead distribution from satellite telemetry and flipper tagging studies. Sea turtles from the NEA DPS are not expected to be present over the North American continental shelf in U.S. coastal waters, where the proposed action occurs (P. Dutton, NMFS, personal communication, 2011). Previous literature (Bowen et al. 2004) has suggested that there is the potential, albeit small, for some juveniles from the Mediterranean DPS to be present in U.S. Atlantic coastal foraging grounds. These data should be interpreted with caution however, as they may be representing a shared common haplotype and lack of representative sampling at Eastern Atlantic rookeries. Given that updated, more refined analyses are ongoing and the occurrence of Mediterranean DPS juveniles in U.S. coastal waters is rare and uncertain, if even occurring at all, for the purposes of this assessment we are making the determination that the Mediterranean DPS is not likely to be present in the action area. Sea turtles of the South Atlantic DPS do not inhabit the action area of this subject fishery (Conant et al. 2009). As such, the remainder of this assessment will only focus on the NWA DPS of loggerhead sea turtles, listed as threatened.

In general, sea turtles are a long-lived species and reach sexual maturity relatively late (NMFS SEFSC 2001; NMFS and USFWS 2007a, 2007b, 2007c, 2007d). Sea turtles are injured and killed by numerous human activities (NRC 1990; NMFS and USFWS 2007a, 2007b, 2007c, 2007d). Nest count data are a valuable source of information for each turtle species since the number of nests laid reflects the reproductive output of the nesting group each year. A decline in the annual nest counts has been measured or suggested for four of five western Atlantic loggerhead nesting groups through 2004 (NMFS and USFWS 2007a), however, data collected since 2004 suggests nest counts have stabilized or increased (TEWG 2009). Nest counts for Kemp's ridley sea turtles as well as leatherback and green sea turtles in the Atlantic demonstrate increased nesting by these species (NMFS and USFWS 2007b, 2007c, 2007d).

6.3.2.2 Large Cetaceans

The most recent Marine Mammal Stock Assessment Report (SAR) (Waring et al. 2010) reviewed the current population trend for each of these cetacean species within U.S. Economic Exclusion Zone (EEZ) waters. The SAR also estimated annual human-caused mortality and serious injury. Finally, it described the commercial fisheries that interact with each stock in the U.S. Atlantic. The following paragraphs summarize information from the SAR.

The western North Atlantic baleen whale species (North Atlantic right, humpback, fin, sei, and minke whales) follow a general annual pattern of migration. They migrate from high

latitude summer foraging grounds, including the Gulf of Maine and Georges Bank, to and latitude winter calving grounds (Perry et al. 1999, Kenney 2002). However, this is a simplification of species movements as the complete winter distribution of most species is unclear (Perry et al. 1999, Waring et al. 2011). Studies of some of the large baleen whales (right, humpback, and fin) have demonstrated the presence of each species in higher latitude waters even in the winter (Swingle et al. 1993, Wiley et al. 1995, Perry et al. 1999, Brown et al. 2002). Blue whales are most often sighted along the east coast of Canada, particularly in the Gulf of St. Lawrence. They occur only infrequently within the U.S. EEZ (Waring et al. 2002).

Available information suggests that the North Atlantic right whale population increased at a rate of 1.8 percent per year between 1990 and 2005. The total number of North Atlantic right whales is estimated to be at least 361 animals in 2005 (Waring et al. 2011). The minimum rate of annual human-caused mortality and serious injury to right whales averaged 2.8 mortality or serious injury incidents per year during 2004 to 2008 (Waring et al. 2011). Of these, fishery interactions resulted in an average of 0.8 mortality or serious injury incidents per year.

The North Atlantic population of humpback whales is conservatively estimated to be 7,698 (Waring et al. 2011). The best estimate for the GOM stock of humpback whale population is 847 whales (Waring et al. 2011). Based on data available for selected areas and time periods, the minimum population estimates for other western North Atlantic whale stocks are 3,269 fin whales, 208 sei whales (Nova Scotia stock), 3,539 sperm whales, and 6,909 minke whales (Waring et al. 2009). Current data suggest that the GOM humpback whale stock is steadily increasing in size (Waring 2011). Insufficient information exists to determine trends for these other large whale species.

Recent revisions to the Atlantic Large Whale Take Reduction Plan (ALWTRP) (72 FR 57104, October 5, 2007) continue to address entanglement risk of large whales (right, humpback, and fin whales, and acknowledge benefits to minke whales) in commercial fishing gear. The revisions seek to reduce the risk of death and serious injury from entanglements that do occur.

6.3.2.3 Small Cetaceans

There is anthropogenic mortality of numerous small cetacean species (dolphins, pilot whales, and harbor porpoise) in spiny dogfish fishing gear. Seasonal abundance and distribution of each species off the coast of the Northeast U.S. varies with respect to life history characteristics. Some species such as white-sided dolphin and harbor porpoise primarily occupy continental shelf waters. Other species such as the Risso's dolphin occur primarily in continental shelf edge and slope waters. Still other species like the common dolphin and the spotted dolphin occupy all three habitats. Waring et al. (2009) summarizes information on the western North Atlantic stocks of each species.

6.3.2.4 Pinnipeds

Harbor seals have the most extensive distribution of the four species of seal expected to occur in the area. Harbor seals sighting have occurred far south as 30° N (Katona et al. 1993, Waring et al. 2009). Gray seals are the second most common seal species in U.S. EEZ waters. They occur primarily in waters off of New England (Katona et al. 1993; Waring et al. 2009). Pupping for both species occurs in both U.S. and Canadian waters of the western North Atlantic. Although there are at least three gray seal pupping colonies in U.S., the majority of harbor seal pupping likely occurs in U.S. waters and the majority of gray seal pupping likely occurs in Canadian waters. Observations of harp and hooded seals are less common in U.S. EEZ waters. Both species form aggregations for pupping and breeding off eastern Canada in the late

winter/early spring. They then travel to more northern latitudes for molting and summer feeding (Waring et al. 2006). Both species have a seasonal presence in U.S. waters from Maine to New Jersey, based on sightings, stranding, and fishery bycatch information (Waring et al. 2009).

6.3.2.5 Atlantic Sturgeon

Atlantic sturgeon is an anadromous species that spawns in relatively low salinity, river environments, but spends most of its life in the marine and estuarine environments from Labrador, Canada to the Saint Johns River, Florida (Holland and Yelverton 1973, Dovel and Berggen 1983, Waldman et al. 1996, Kynard and Horgan 2002, Dadswell 2006, ASSRT 2007). Tracking and tagging studies have shown that subadult and adult Atlantic sturgeon that originate from different rivers mix within the marine environment, utilizing ocean and estuarine waters for life functions such as foraging and overwintering (Stein et al. 2004a, Dadswell 2006, ASSRT 2007, Laney et al. 2007, Dunton et al. 2010). Fishery-dependent data as well as fishery-independent data demonstrate that Atlantic sturgeon use relatively shallow inshore areas of the continental shelf; primarily waters less than 50 m (Stein et al. 2004b, ASMFC 2007, Dunton, et al. 2010). The data also suggest regional differences in Atlantic sturgeon depth distribution with sturgeon observed in waters primarily less than 20 m in the Mid-Atlantic Bight and in deeper waters in the Gulf of Maine (Stein et al. 2004b, ASMFC 2007, Dunton et al. 2010). Information on population sizes for each Atlantic sturgeon DPS is very limited. Based on the best available information, NMFS has concluded that bycatch, vessel strikes, water quality and water availability, dams, lack of regulatory mechanisms for protecting the fish, and dredging are the most significant threats to Atlantic sturgeon.

Comprehensive information on current abundance of Atlantic sturgeon is lacking for all of the spawning rivers (ASSRT 2007). Based on data through 1998, an estimate of 863 spawning adults per year was developed for the Hudson River (Kahnle et al. 2007), and an estimate of 343 spawning adults per year is available for the Altamaha River, GA, based on data collected in 2004-2005 (Schueller and Peterson 2006). Data collected from the Hudson River and Altamaha River studies cannot be used to estimate the total number of adults in either subpopulation, since mature Atlantic sturgeon may not spawn every year, and it is unclear to what extent mature fish in a non-spawning condition occur on the spawning grounds. Nevertheless, since the Hudson and Altamaha Rivers are presumed to have the healthiest Atlantic sturgeon subpopulations within the United States, other U.S. subpopulations are predicted to have fewer spawning adults than either the Hudson or the Altamaha (ASSRT 2007). It is also important to note that the estimates above represent only a fraction of the total population size as spawning adults comprise only a portion of the total population (e.g., this estimate does not include subadults and early life stages). A status review for Atlantic sturgeon was completed in 2007 which indicated that five distinct population segments (DPS) of Atlantic sturgeon exist in the United States (ASSRT 2007). On October 6, 2010, NMFS proposed listing these five DPSs of Atlantic sturgeon along the U.S. East Coast as either threatened or endangered species (75 FR 61872 and 75 FR 61904). A final listing was published on February 6th, 2012 (77 FR 5880 and 75 FR 5914). The GOM DPS of Atlantic sturgeon has been listed as threatened, and the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon have been listed as endangered. Atlantic sturgeon from any of the five DPSs could occur in areas where the spiny dogfish fishery operates.

Since the ESA listing of Atlantic sturgeon, new stock assessment efforts have been completed (Kocik et al. 2013). Atlantic sturgeon are frequently sampled during the Northeast Area Monitoring and Assessment (NEAMAP) survey. NEAMAP has been conducting trawl

surveys from Cape Cod, Massachusetts to Cape Hatteras, North Carolina in nearshore waters at depths to 18.3 meters (60 feet) during the fall since 2007 and depths up to 36.6 meters (120 feet) during the spring since 2008 using a spatially stratified random design with a total of 35 strata and 150 stations per survey. The information from this survey can be directly used to calculate minimum swept area population estimates during the fall, which range from 6,980 to 42,160 with coefficients of variation between 0.02 and 0.57 and during the spring, which range from 25,540 to 52,990 with coefficients of variation between 0.27 and 0.65. These are considered minimum estimates because the calculation makes the unlikely assumption that the gear will capture 100% of the sturgeon in the water column along the tow path. Efficiencies less than 100% will result in estimates greater than the minimum. The true efficiency depends on many things including the availability of the species to the survey and the behavior of the species with respect to the gear. True efficiencies much less than 100% are common for most species. The 50% efficiency assumption seems to reasonably account for the robust, yet not complete sampling of the Atlantic sturgeon oceanic temporal and spatial ranges and the documented high rates of encounter with NEAMAP survey gear and Atlantic sturgeon. For this analysis, we have determined that the best available data at this time are the population estimates derived from NEAMAP swept area biomass. We have determined that using the median value of the 50% efficiency as the best estimate of the Atlantic sturgeon ocean population is most appropriate at this time. This results in a total population size estimate of 67,776 fish, which is considerably higher than the estimates that were available at the time of listing (Kocik et al. 2013).

6.3.2.6 Species Not Likely to be Affected

NMFS has determined that the action being considered in this EA is not likely to adversely affect shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, hawksbill sea turtles, blue whales, or sperm whales, all of which are listed as endangered species under the ESA. Further, the action considered in this EA is not likely to adversely affect North Atlantic right whale critical habitat. The following discussion provides the rationale for these determinations.

Shortnose sturgeon are benthic fish that mainly occupy the deep channel sections of large rivers. They occupy rivers along the western Atlantic coast from St. Johns River in Florida, to the Saint John River in New Brunswick, Canada. Although, the species is possibly extirpated from the Saint Johns River system. The species is anadromous in the southern portion of its range (i.e., south of Chesapeake Bay), while some northern populations are amphidromous (NMFS 1998). Since the spiny dogfish fishery would not operate in or near the rivers where concentrations of shortnose sturgeon are most likely found, it is highly unlikely that sectors would affect shortnose sturgeon.

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Juvenile salmon in New England rivers typically migrate to sea in spring after a one- to three-year period of development in freshwater streams. They remain at sea for two winters before returning to their U.S. natal rivers to spawn (Kocik and Sheehan 2006). Results from a 2001-2003 post-smolt trawl survey in the nearshore waters of the Gulf of Maine indicate that Atlantic salmon post-smolts are prevalent in the upper water column throughout this area in mid to late May (Lacroix, Knox, and Stokesbury 2005). Therefore, commercial fisheries deploying small-mesh active gear (pelagic trawls and purse seines within 10 m of the surface) in nearshore waters of the Gulf of Maine may have the potential to incidentally take smolts. However, it is highly unlikely that the action being considered will affect the Gulf of Maine DPS of Atlantic salmon given that operation of the dogfish fishery does

not occur in or near the rivers where concentrations of Atlantic salmon are likely to be found. Additionally, dogfish gear operates in the ocean at or near the bottom rather than near the surface where Atlantic salmon are likely to occur. Thus, this species will not be considered further in this EA.

North Atlantic right whales occur in coastal and shelf waters in the western North Atlantic (NMFS 2005). Section 4.4.2.2 discusses potential fishery entanglement and mortality interactions with North Atlantic right whale individuals. The western North Atlantic population in the U.S. primarily ranges from winter calving and nursery areas in coastal waters off the southeastern U.S. to summer feeding grounds in New England waters (NMFS 2005). North Atlantic Right Whales use five well-known habitats annually, including multiple in northern waters. These northern areas include the Great South Channel (east of Cape Cod); Cape Cod and Massachusetts Bays; the Bay of Fundy; and Browns and Baccaro Banks, south of Nova Scotia. NMFS designated the Great South Channel and Cape Cod and Massachusetts Bays as Northern Atlantic right whale critical habitat in June 1994 (59 FR 28793). NMFS has designated additional critical habitat in the southeastern U.S. Dogfish gear operates in the ocean at or near the bottom rather than near the surface. It is not known whether the bottom-trawl, or any other type of fishing gear, has an impact on the habitat of the Northern right whale (59 FR 28793). Further, mesh sizes used in the dogfish fishery do not significantly impact the Northern right whale's planktonic food supply (59 FR 28793). Therefore, Northern right whale food sources in areas designated as critical habitat would not be adversely affected by sectors. For these reasons, Northern right whale critical habitat will not be considered further in this EA.

The hawksbill turtle is uncommon in the waters of the continental U.S. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America. Hawksbills feed primarily on a wide variety of sponges, but also consume bryozoans, coelenterates, and mollusks. The Culebra Archipelago of Puerto Rico contains especially important foraging habitat for hawksbills. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills in south Florida and individuals have been sighted along the east coast as far north as Massachusetts; however, east coast sightings north of Florida are rare (NMFS 2009a). Operations in the spiny dogfish fishery would not occur in waters that are typically used by hawksbill sea turtles. Therefore, it is highly unlikely that fishery operations would affect this turtle species.

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring et al. 2002). In the North Atlantic region, blue whales are most frequently sighted from April to January (Sears 2002). No blue whales were observed during the Cetacean and Turtle Assessment Program surveys of the mid- and North Atlantic areas of the outer continental shelf (Cetacean and Turtle Assessment Program 1982). Calving for the species occurs in low latitude waters outside of the area where the sectors would operate. Blue whales feed on euphausiids (krill) that are too small to be captured in fishing gear. There were no observed fishery-related mortalities or serious injuries to blue whales between 1996 and 2000 (Waring et al. 2002). The species is unlikely to occur in areas where the sectors would operate, and sector operations would not affect the availability of blue whale prey or areas where calving and nursing of young occurs. Therefore, the Proposed Action would not be likely to adversely affect blue whales.

Unlike blue whales, sperm whales do regularly occur in waters of the U.S. EEZ. However, the distribution of the sperm whales in the U.S. EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2007). Sperm whale distribution is typically concentrated east-northeast of Cape Hatteras in winter and shifts northward in spring when whales are found throughout the MA Bight (Waring et al. 2006). Distribution extends further northward to areas north of GB and the Northeast Channel region in summer and then south of New England in fall, back to the MA Bight (Waring et al. 1999). In

contrast, the sectors would operate in continental shelf waters. The average depth over which sperm whale sightings occurred during the Cetacean and Turtle Assessment Program surveys was 5,879 ft (1,792 m) (Cetacean and Turtle Assessment Program 1982). Female sperm whales and young males almost always inhabit open ocean, deep water habitat with bottom depths greater than 3,280 ft (1,000 m) and at latitudes less than 40° N (Whitehead 2002). Sperm whales feed on large squid and fish that inhabit the deeper ocean regions (Perrin et al. 2002). There were no observed fishery-related mortalities or serious injuries to sperm whales between 2001 and 2005 (Waring et al. 2007). Sperm whales are unlikely to occur in water depths where the sectors would operate, sector operations would not affect the availability of sperm whale prey or areas where calving and nursing of young occurs. Therefore, the Proposed Action would not be likely to adversely affect sperm whales.

Although marine turtles and large whales could be potentially affected through interactions with fishing gear, NMFS has determined that the continued authorization of the spiny dogfish fishery, would not have any adverse effects on the availability of prey for these species. Sea turtles feed on a variety of plants and animals, depending on the species. However, none of the turtle species are known to feed upon groundfish. Right whales and sei whales feed on copepods (Horwood 2002, Kenney 2002). The spiny dogfish fishery will not affect the availability of copepods for foraging right and sei whales because copepods are very small organisms that will pass through fishing gear rather than being captured in it. Humpback whales and fin whales also feed on krill as well as small schooling fish such as sand lance, herring and mackerel (Aguilar 2002, Clapham 2002). Spiny dogfish fishing gear operates on or very near the bottom. Fish species caught in bottom gear are species that live in benthic habitat (on or very near the bottom) such as flounders. As a result, this gear does not typically catch schooling fish such as herring and mackerel that occur within the water column. Therefore, the Proposed Action will not affect the availability of prey for foraging humpback or fin whales.

6.3.3 Interactions Between Gear and Protected Resources

NMFS categorizes commercial fisheries based on a two-tiered, stock-specific fishery classification system that addresses both the total impact of all fisheries on each marine mammal stock as well as the impact of individual fisheries on each marine mammal stock. NMFS bases the system on the numbers of animals per year that incur incidental mortality or serious injury due to commercial fishing operations relative to a marine mammal stock's Potential Biological Removal (PBR) level.[12] Tier 1 takes into account the cumulative mortality and serious injury to marine mammals caused by commercial fisheries. Tier 2 considers marine mammal mortality and serious injury caused by the individual fisheries. This EA uses Tier 2 classifications to indicate how each type of gear proposed for use in the Proposed Action may affect marine mammals (NMFS 2009b). Table 12 identifies the classifications used in the final List of Fisheries for FY 2013 (78 FR 53336; August 29, 2013; NMFS 2013b), which are broken down into Tier 2 Categories I, II, and III. A proposed List of Fisheries for FY 2014 was published on December 6, 2013 (78 FR 73477), but the List of Fisheries for FY 2014 has not yet been adopted and is not discussed further in this document.

Table 13. Descriptions of the Fishery Classification Categories

[12] PBR is the maximum number of animals, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

Category	Category Description
Category I	A commercial fishery that has frequent incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is, by itself, responsible for the annual removal of 50 percent or more of any stock's PBR level.
Category II	A commercial fishery that has occasional incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that, collectively with other fisheries, is responsible for the annual removal of more than 10 percent of any marine mammal stock's PBR level and that is by itself responsible for the annual removal of between 1 percent and 50 percent, exclusive of any stock's PBR.
Category III	A commercial fishery that has a remote likelihood of, or no known incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that collectively with other fisheries is responsible for the annual removal of: a. Less than 50 percent of any marine mammal stock's PBR level, or b. More than 1 percent of any marine mammal stock's PBR level, yet that fishery by itself is responsible for the annual removal of 1 percent or less of that stock's PBR level. In the absence of reliable information indicating the frequency of incidental mortality and serious injury of marine mammals by a commercial fishery, the Assistant Administrator would determine whether the incidental serious injury or mortality is "remote" by evaluating other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, qualitative data from logbooks or fisher reports, stranding data, and the species and distribution of marine mammals in the area or at the discretion of the Assistant Administrator.

Interactions between gear and a given species occur when fishing gear overlaps both spatially and trophically with the species' niche. Spatial interactions are more "passive" and involve inadvertent interactions with fishing gear when the fishermen deploy gear in areas used by protected resources. Trophic interactions are more "active" and occur when protected species attempt to consume prey caught in fishing gear and become entangled in the process. Spatial and trophic interactions can occur with various types of fishing gear used by the spiny dogfish fishery through the year. Many large and small cetaceans and sea turtles are more prevalent within the operations area during the spring and summer. However they are also relatively abundant during the fall and would have a higher potential for interaction with sector activities that occur during these seasons. Although harbor seals may be more likely to occur in the operations area between fall and spring, harbor and gray seals are year-round residents. Therefore, interactions could occur year-round. The uncommon occurrences of hooded and harp seals in the operations area are more likely to occur during the winter and spring, allowing for an increased potential for interactions during these seasons.

Although interactions between protected species and gear deployed by the spiny dogfish fishery would vary, interactions generally include:

- Becoming caught on hooks (bottom longlines)
- Entanglement in mesh (gillnets and trawls)
- Entanglement in the float line (gillnets and trawls)
- Entanglement in the groundline (gillnets, trawls, and bottom longlines)
- Entanglement in anchor lines (gillnets and bottom longlines), or
- Entanglement in the vertical lines that connect gear to the surface and surface systems (gillnets, traps/pots, and bottom longlines).

NMFS assumes the potential for entanglements to occur is higher in areas where more gear is set and in areas with higher concentrations of protected species.

Table 13 lists the marine mammals known to have had interactions with gear used by the spiny dogfish fishery. This gear includes sink gillnets, bottom trawls, and hook gear within the Northeast Region, as excerpted from the List of Fisheries for FY 2013 ([78 FR 53336; August 29, 2013], also see Waring et al. 2009). Sink gillnets have the greatest potential for interaction with protected resources, followed by bottom trawls. There are no observed reports of interactions between longline gear and marine mammals in the past five years. However, interactions between the pelagic longline fishery and both pilot whales and Risso's dolphins led to the development of the Pelagic Longline Take Reduction Plan.

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Table 14. Marine Mammals Impacts Based on Groundfishing Gear and Spiny Dogfish Fishing Areas (Based on 2013 List of Fisheries)

Fishery		Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category	Type		
Category I	MA gillnet	5,509	Bottlenose dolphin, Northern Migratory coastal.[1] Bottlenose dolphin, Southern Migratory coastal.[1] Bottlenose dolphin, Northern NC estuarine system.[1] Bottlenose dolphin, Southern NC estuarine system.[1] Bottlenose dolphin, WNA offshore. Common dolphin, WNA. Gray seal, WNA. Harbor porpoise, GME/BF. Harbor seal, WNA. Harp seal, WNA. Humpback whale, Gulf of Maine. Long-finned pilot whale, WNA. Minke whale, Canadian east coast. Risso's dolphin, WNA. Short-finned pilot whale, WNA White-sided dolphin, WNA.
	Northeast sink gillnet	4,375	Bottlenose dolphin, WNA offshore. Common dolphin, WNA. Fin whale, WNA. Gray seal, WNA. Harbor porpoise, GME/BF.[1] Harbor seal, WNA. Harp seal, WNA. Hooded seal, WNA. Humpback whale, Gulf of Maine. Long-finned Pilot whale, WNA. Minke whale, Canadian east coast. North Atlantic right whale, WNA. Risso's dolphin, WNA. Short-finned Pilot whale White-sided dolphin, WNA.
Category II	Mid-Atlantic bottom trawl	631	White-sided dolphin, WNA. Bottlenose dolphin, WNA offshore. Common dolphin, WNA.[1] Gray seal, WNA. Harbor seal, WNA. Long-finned pilot whale, WNA.[1] Risso's dolphin, WNA.[1] Short-finned pilot whale, WNA.[1] White-sided dolphin, WNA.
	Northeast bottom trawl	2,987	Bottlenose dolphin, WNA offshore. Common dolphin, WNA. Gray seal, WNA. Harbor porpoise, GME/BF. Harbor seal, WNA. Harp seal, WNA. Long-finned pilot whale, WNA. Minke whale, Canadian East Coast. Short-finned pilot whale, WNA. White-sided dolphin, WNA
Category III	Northeast/Mid-Atlantic bottom longline/hook-and-line	>1,207	None documented.

Notes:

[1] Fishery classified based on serious injuries and mortalities of this stock, which are greater than 50 percent (Category I) or greater than 1 percent and less than 50 percent (Category II) of the stock's PBR.

Marine mammals are taken in gillnets, trawls, and hook gear used in the spiny dogfish fishery. Documented protected species interactions in Mid-Atlantic gillnet and Northeast sink gillnet fisheries are provided in Table 13. Spiny dogfish vessels would be required to adhere to measures in the Atlantic Large Whale Take Reduction Plan (ALWTRP) to minimize potential impacts to certain cetaceans. ALWTRP was developed to address entanglement risk to right, humpback, and fin whales, and to acknowledge benefits to minke whales in specific Category I or II commercial fishing with gillnets. The ALWTRP calls for the use of gear markings, area restrictions, weak links, and sinking groundlines. Spiny dogfish vessels would also need to comply with the Bottlenose Dolphin Take Reduction Plan and Harbor Porpoise Take Reduction Plan (HPTRP). The Bottlenose Dolphin Take Reduction Plan restricts night time use of gillnets in the MA gillnet region. The HPTRP aims to reduce interactions between the harbor porpoise and gillnets in the Northeast Region . The HPTRP implements seasonal area closures, gear modifications and the seasonal use of pingers (acoustic devices that emit a sound) to deter harbor porpoises from approaching the nets.

Data from spiny dogfish trips from 2008-2012indicate no overall significant increase in take of protected resources or sea turtles. On an annual basis, an average of 0.8 harbor porpoise (min 0 max 2) and 1.0 harbor seals (min 0 max 2) entanglements were observed annually.

Sea turtles have been caught and injured or killed in multiple types of fishing gear, including gillnets, trawls, and hook and line gear. However, impact due to inadvertent interaction with trawl gear is almost twice as likely to occur when compared with other gear types (NMFS 2009c). Interaction with trawl gear is more detrimental to sea turtles as they can be caught within the trawl itself and will drown after extended periods underwater. A study conducted in the MA region showed that bottom trawling accounts for an average annual take of 616 loggerhead sea turtles, although Kemp's ridleys and leatherbacks were also caught during the study period (Murray 2006). Gillnets are considered more detrimental to marine mammals such as pilot whales, dolphins, porpoises, and seals, as well as large marine whales; however, protection for marine mammals would be provided through various Take Reduction Plans outlined above.

Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein et al. 2004a, ASMFC TC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for bycaught sturgeon (ASMFC TC 2007). Sturgeon deaths were rarely reported in the otter trawl observer dataset (ASMFC TC 2007). However, the level of mortality after release from the gear is unknown (Stein et al. 2004a). In a review of the Northeast Fishery Observer Program (NEFOP) database for the years 2001-2006, observed bycatch of Atlantic sturgeon was used to calculate bycatch rates that were then applied to commercial fishing effort to estimate overall bycatch of Atlantic sturgeon in commercial fisheries. This review indicated sturgeon bycatch occurred in statistical areas abutting the coast from Massachusetts (statistical area 514) to North Carolina (statistical area 635) (ASMFC TC 2007). Based on the available data, participants in an ASMFC bycatch workshop concluded that sturgeon encounters tended to occur in waters less than 50 m throughout the year, although seasonal patterns exist (ASMFC TC 2007). The ASMFC analysis determined that an average of 650 Atlantic sturgeon mortalities occurred per year (during the 2001 to 2006 timeframe) in sink gillnet fisheries. Stein et al. (2004a), based on a review of the NMFS Observer Database from 1989-2000, found clinal variation in the bycatch rate of sturgeon in sink gillnet gear with lowest rates occurring off of Maine and highest rates off of North Carolina for all months of the year.

In an updated, preliminary analysis, the Northeast Fisheries Science Center (NEFSC) was able to use data from the NEFOP database to provide updated estimates for the 2006 to 2010 timeframe. Data were limited by observer coverage to waters outside the coastal boundary and north of Cape Hatteras, NC. Sturgeon included in the data set were those identified by federal observers as

Atlantic sturgeon, as well as those categorized as unknown sturgeon. At this time, data were limited to information collected by the NEFOP; limited data collected in the At-Sea Monitoring Program were not included, although preliminary views suggest the incidence of sturgeon encounters was low.

The preliminary analysis apportioned the estimated weight of all sturgeon takes to specific fishery management plans. The analysis estimates that between 2006 and 2010, a total of 15,587 lbs of Atlantic sturgeon were captured and discarded in bottom otter trawl (7,740 lbs) and sink gillnet (7,848 lbs) gear. The analysis results indicate that 7.1% (550 lbs) of the weight of sturgeon discards in bottom otter trawl gear could be attributed to the large mesh bottom trawl fisheries if a correlation of FMP species landings (by weight) was used as a proxy for fishing effort. Additionally, the analysis results indicate that 4.0% (314 lbs) of the weight of sturgeon discards in sink gillnet gear could be attributed to the large mesh gillnet fisheries if a correlation of FMP species landings (by weight) was used as a proxy for fishing effort.

These additional data support the conclusion from the earlier bycatch estimates that the spiny dogfish fishery may interact with Atlantic sturgeon. A Biological Opinion (NMFS 2013a) was issued on December 16, 2013 and concluded that the spiny dogfish fishery may adversely affect, but is not likely to jeopardize the continued existence of any of the five DPSs of Atlantic sturgeon. The Biological Opinion included reasonable and prudent measures, as well as terms and conditions which will further reduce impacts to Atlantic sturgeon.

6.4 Human Communities

A detailed description of historical fisheries for spiny dogfish is presented in Section 2.3 of the FMP. The information presented in this section is intended to briefly characterize recent fisheries trends.

6.4.1 Commercial Vessel and Dealer Activity

According to unpublished NMFS permit file data, 2,666 vessels were issued federal spiny dogfish permits in 2012, while 408 of these vessels contributed to overall landings. The distribution of permitted and active vessels by home port state is given in Table 14. Most of the active vessels were from Massachusetts (36.27%), New Jersey (15.93%), and Rhode Island (12.50%).

Table 15. Federally permitted dogfish vessel activity by home port state in FY2012. Active vessels are defined as vessels identified in the dealer reports as having landed spiny dogfish in FY2012.

State	Permitted Vessels	Pct of Total	State	Active Vessels	Pct of Total
MA	976	36.61%	MA	148	36.27%
NJ	402	15.08%	NJ	65	15.93%
ME	288	10.80%	RI	51	12.50%
NY	268	10.05%	NY	36	8.82%
RI	176	6.60%	VA	29	7.11%
NC	150	5.63%	NH	26	6.37%
VA	128	4.80%	MD	17	4.17%
NH	124	4.65%	ME	15	3.68%
CT	51	1.91%	NC	11	2.70%
MD	42	1.58%	CT	8	1.96%
DE	29	1.09%	Other	2	0.49%
PA	18	0.68%	Total	408	100.00%
FL	10	0.38%			
Other	4	0.15%			
Total	2,666	100.00%			

Source: NMFS permit data, Commercial Fisheries Database

NMFS permit data indicate that 317 dealers possessed federal spiny dogfish dealer permits in 2012 while dealer reports indicate 77 of those dealers actually bought spiny dogfish. The distribution of permitted and active dealers by state is given in Table 15. Most of the active dealers were from the states of Massachusetts (28.57%), New York (16.88%), North Carolina (15.58%), Rhode Island (14.29%).

Table 16. Federally permitted spiny dogfish dealers by state in FY2012. Active dealers are defined as dealers identified in the federal dealer reports as having bought spiny dogfish in FY2012.

State	Permitted Dealers	Pct of Total	State	Active Dealers	Pct of Total
MA	89	28.08%	MA	22	28.57%
NY	65	20.50%	NY	13	16.88%
NJ	42	13.25%	NC	12	15.58%
RI	37	11.67%	RI	11	14.29%
NC	23	7.26%	NJ	5	6.49%
VA	19	5.99%	VA	5	6.49%
ME	18	5.68%	ME	3	3.90%
NH	8	2.52%	Other	6	7.79%
MD	7	2.21%	Total	77	100.00%
PA	3	0.95%			
Other	6	1.89%			
Total	317	100.00%			

Landings by State

Commercial harvest has historically been dominated by Massachusetts (Table 16). Starting in 2007, dogfish landings from Virginia were greater than or approximately equivalent to those of Massachusetts. State-by-state landings since 2007 are influenced by the regional allocation of commercial quota through the ASMFC's Interstate FMP. Currently, that FMP allocates 58% of the annual quota to a northern region (Maine –Connecticut), and the remaining 42% among states from New York – North Carolina (NY 2.707%; NJ 7.644%; DE 0.896%; MD 5.920%; VA 10.795%, NC 14.036%).

In fishing year 2012, Massachusetts accounted for 49.56% of coastwide landings. Virginia (11.79%), North Carolina (11.72%), New Jersey (6.79%), New Hampshire (6.68%), Rhode Island (6.05%) were also important landings states. No other states contributed more than 5% of annual landings

Table 17. Commercial landings (1,000s lb) of spiny dogfish by state from fishing years 1989 through 2012.

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Total
1989	4,962	0	5,100	47	24	13	1,434	0	714	18	0	9,903
1990	6,251	185	20,304	2,968	9	44	4,754	0	5,150	62	41	32,475
1991	2,059	0	13,523	1,901	22	74	2,382	6	3,338	165	1,463	29,049
1992	1,818	405	17,457	2,116	9	140	1,493	0	1,877	220	8,635	37,165
1993	3,408	1,639	26,189	1,554	170	100	707	0	1,893	379	8,806	45,509
1994	1,788	2,610	23,181	603	85	475	1,422	63	2,233	665	6,929	41,447
1995	1,683	2,094	28,789	414	408	815	2,581	0	7,752	1,065	9,525	50,068
1996	904	1,135	27,208	1,518	619	1,381	5,833	0	4,820	4,832	10,304	60,055
1997	437	999	21,417	682	282	312	3,831	0	2,105	3,945	5,924	40,460
1998	288	1,935	24,866	1,906	241	1,704	7,091	2	2,199	5,004	3,928	45,476
1999	28	1,233	14,824	1,237	87	2,868	6,586	0	808	1,750	3,601	32,760
2000	1	2,279	5,545	130	12	145	5	0	0	72	12	20,407
2001	0	529	3,912	395	7	62	17	0	0	178	0	5,056
2002	1	349	3,800	455	6	49	1	0	2	114	0	4,839
2003	0	175	2,006	141	2	41	0	0	5	451	520	2,579
2004	3	0	1,094	129	60	42	7	0	1	39	20	2,160
2005	31	162	1,826	173	93	44	1	0	11	66	10	2,535
2006	180	633	2,744	518	62	11	3	0	16	2,286	144	5,212
2007	99	185	2,796	523	23	21	10	0	25	2,575	167	7,723
2008	49	1,370	3,559	239	10	23	50	0	114	2,479	1,416	9,057
2009	594	1,885	3,881	940	92	192	1,342	14	175	1,487	1,708	11,752
2010	229	1,214	6,442	708	107	468	1,208	8	542	1,731	1,887	14,543
2011	349	1,526	9,069	1,265	187	407	1,628	31	1,265	2,237	2,177	20,140
2012	227	1,815	13,253	1,619	161	308	1,787	13	1,270	3,152	3,135	26,739

Source: NMFS Commercial Fisheries Database.

Landings by Month

Previously, under the federal FMP, the annual commercial quota was allocated seasonally to two half-year periods. Period 1 (May 1 – Oct 31) was allocated 57.9% of the quota and Period 2 was allocated 42.1% of the quota. This allocation scheme was implemented during rebuilding in order to match seasonal availability of the resource with the historic geographic landings patterns. Spiny dogfish migratory behavior generally makes them available to the northern end of the fishery (i.e., MA) during Period 1 and the southern end of the fishery (i.e., (VA and NC) during Period 2. In fishing year 2012, spiny dogfish were landed in all months with peak landings occurring in July-September (Table 17).

Table 18. Spiny dogfish landings (lb) by month in FY2012.

Month	Landings(lb)	Pct of Total
May	634,757	2.37%
Jun	1,453,669	5.43%
Jul	3,773,953	14.10%
Aug	3,830,129	14.31%
Sep	4,153,917	15.52%
Oct	2,059,634	7.70%
Nov	2,297,278	8.58%
Dec	2,436,100	9.10%
Jan	1,875,335	7.01%
Feb	1,563,377	5.84%
Mar	1,698,365	6.35%
Apr	985,608	3.68%
Total	26,762,122	100.00%

Source: NMFS Commercial Fisheries Database

6.4.2 Commercial Fishery Value

Unpublished NMFS dealer reports indicate that the total ex-vessel value of commercially landed spiny dogfish in in fishing year 2012 was about $5.277 million and the approximate price/lb of spiny dogfish $0.20 (Table 18).

Table 19. Ex-vessel value and price per pound of commercially landed spiny dogfish, Maine - North Carolina combined, 2000-2012.

Fishing Year	Value ($1,000)	Price ($/lb)
2000	1,989	0.24
2001	1,147	0.23
2002	970	0.20
2003	415	0.12
2004	260	0.17
2005	545	0.21
2006	1,434	0.22
2007	1,360	0.20
2008	2,157	0.24
2009	2,360	0.22
2010	3,119	0.21
2011	4,434	0.22
2012	5,277	0.20

Source: NMFS Commercial Fisheries Database

In FY2011, 174 vessels with federal dogfish permits were reported in the dealer data to have had dogfish revenues greater than 5% of total revenue (dogfish revenue range $100 to 51,029, average = $14,454; dogfish rev / total rev range 5.0% to 100%, average = 41.0%).

6.4.3 Port and Community Description

U.S. fishing communities directly involved in the harvest or processing of dogfish are found in coastal states from Maine through North Carolina. Landings by port for FY2012 are given in Table 19. Chatham, MA accounted for the largest share of total FY2012 landings (16.40%), followed by Gloucester, MA (10.91%), Hatteras, NC (8.27%), Marshfield, MA (6.84%), and Scituate, MA (6.18%). Because harvest levels are not impacted by the actions under this EA, a full characterization of these ports is not provided. A complete set of port profiles is online: http://www.nefsc.noaa.gov/read/socialsci/community_profiles/

Table 20. Commercial landings (lb) and value of spiny dogfish by port for fishing year 2012. Only ports with spiny dogfish landings valued at >$100,000 are shown.

Port	Landings (lb)	Pct of Total	Value ($)	Pct of Total	Total Port Value ($)	Dogfish Value / Port Value
CHATHAM, MASSACHUSETTS	4,388,714	16.40%	846,630	16.04%	16,248,502	5.21%
GLOUCESTER, MASSACHUSETTS	2,919,876	10.91%	673,991	12.77%	52,237,552	1.29%
MARSHFIELD, MASSACHUSETTS	1,830,727	6.84%	413,473	7.83%	3,288,455	12.57%
SCITUATE, MASSACHUSETTS	1,654,285	6.18%	373,902	7.09%	4,057,166	9.22%
OCEAN CITY, MARYLAND	1,266,099	4.73%	252,633	4.79%	4,139,010	6.10%
NEW BEDFORD, MASSACHUSETTS	947,435	3.54%	246,851	4.68%	401,246,684	0.06%
HATTERAS, NORTH CAROLINA	2,212,833	8.27%	221,974	4.21%	2,941,670	7.55%
VA BEACH/LYNNHAVEN, VIRGINIA	1,138,056	4.25%	202,274	3.83%	2,244,439	9.01%
CHINCOTEAGUE, VIRGINIA	904,833	3.38%	183,320	3.47%	9,325,565	1.97%
RYE, NEW HAMPSHIRE	618,610	2.31%	158,737	3.01%	1,872,485	8.48%
LITTLE COMPTON, RHODE ISLAND	786,346	2.94%	158,639	3.01%	2,945,894	5.39%
BARNEGAT LIGHT, NEW JERSEY	783,616	2.93%	153,715	2.91%	26,684,621	0.58%
POINT PLEASANT, NEW JERSEY	813,888	3.04%	145,391	2.76%	23,899,465	0.61%
PORTSMOUTH, NEW HAMPSHIRE	709,148	2.65%	141,820	2.69%	5,574,467	2.54%
PLYMOUTH, MASSACHUSETTS	575,712	2.15%	125,286	2.37%	4,039,918	3.10%
HARWICHPORT, MASSACHUSETTS	442,641	1.65%	123,937	2.35%	4,143,328	2.99%
SEABROOK, NEW HAMPSHIRE	486,796	1.82%	112,862	2.14%	2,108,631	5.35%
POINT JUDITH, RHODE ISLAND	688,373	2.57%	101,823	1.93%	41,534,815	0.25%

Source: Unpublished NMFS dealer reports

7.0 ENVIRONMENTAL CONSEQUENCES – ANALYSIS OF DIRECT AND INDIRECT IMPACTS

This section presents an analysis of the impacts of the proposed actions (Section 5.0) on the VECs (Section 6.0). Table 20, below, is provided to re-iterate the management measures that correspond to each of the alternatives. There are no impacts for most of the alternatives. Amendment 3 is focused primarily on administrative improvements in the Spiny Dogfish FMP. These improvements will provide an option for the Councils to encourage spiny dogfish research (Alternative 1B, 1C), bring the FMP into full compliance with the MSA (Alternative 2B), close regulatory loopholes (Alternative 3B) and reduce administrative conflicts with the Interstate FMP (Alternatives 4B, 4C).

Table 21. Qualitative summary of the expected impacts of various alternatives considered for Amendment 3. A minus sign (-) signifies an expected negative impact, a plus sign (+) a positive impact, and zero indicates a null impact. Brackets are used to convey a minor effect, such as slight positive [+].

Issue	Alternatives	Managed Resource	Non-Target Species	EFH	Protected Resources	Economic	Social
Research Set-Aside	Alt. 1a No Action	0	0	0	0	0	0
	Alt. 1b 3% RSA	[+]	[+]	[+]	[+]	[+]	[+]
	Alt. 1c 5% RSA	[+]	[+]	[+]	[+]	[+]	[+]
Essential Fish Habitat	Alt. 2a No Action	[+]	[+]	+	[+]	[+]	[+]
	Alt. 2b Update EFH	[+]	[+]	+	[+]	[+]	[+]
Delayed Implementation of Commercial Quota	Alt. 3a No Action	[-]	[-]	0	0	0	0
	Alt. 3b Maintain Previous Year Measures	[+]	[+]	0	0	0	0
Commercial Quota Allocation	Alt. 4a No Action	0	0	0	0	[-]	-
	Alt. 4b No Allocation	0	0	0	0	0	[+]
	Alt. 4c Match ISFMP	0	0	0	0	0	[+]

7.1 RESEARCH SET-ASIDE

Alternatives: 1A: no action (no RSAs)
1B: (Preferred) allow allocation of up to 3% of commercial quota as RSA
1C: allow allocation of up to 5% of commercial quota as RSA

Impacts
No direct impacts to the managed resource and non-target VECs are associated with the alternatives under this issue as allocation to an RSA program since the total amount of harvest would continue to be controlled by the commercial quota. However, it could also be argued that slight positive indirect impacts will occur for any of the VECs since research that is done using spiny dogfish RSA could provide findings that indirectly improve management of the stock and these improvements could, in turn, benefit the managed resource, habitat, protected resources, and the social/economic environment. Among the action alternatives, the larger set aside amount (5% under 1C) is provided to allow for a larger awards of RSA since the low value of spiny dogfish (~$ 0.20/lb) may constrain interest in participating in a project that will depend on marginal gains from directed fishing for spiny dogfish. The smaller (3% under Alternative 1B) may still be enough to provide all the landings that are requested at the RSA auction. In other words, the marginal benefit to participating in the RSA program may be somewhat enhanced as larger RSA awards are provided. Therefore, alternative 1C may have a slightly more positive impact on the VECs compared to Alternative 1B. Acknowledging that such indirect impacts are speculative at this stage, a determination of slight positive benefits to all VECs is made at this time for both the action alternatives (1B, 1C) compared to the no action. Null impacts on all VECs are expected for the no-action alternative (1A) since the commercial quota would continue to control the total amount of harvest.

Note the set-aside will always be deducted from and not in addition to the Total Allowable landings that are specified. Therefore, the impacts resulting from the harvest of set-aside quantities are not pertinent to this action as they would be fully accounted for in the accompanying specifications package. Similarly, if a research set-aside project requests an exemption from an existing fisheries regulation, an impact analysis would be prepared at that time.

7.2 ESSENTIAL FISH HABITAT

Alternatives: 2A: No action (Review but do not update EFH definitions)
2B: (Preferred) Update EFH definitions as needed

Impacts

The Councils chose Alternative 2B as their preferred alternative in order to bring the FMP into compliance with the MSA. Under this alternative, the text and maps used to establish the EFH designations for spiny dogfish would be updated to include federal and other biological survey data that have been collected in a more recent timeframe. Because the different sex and size-specific life history stages of spiny dogfish occupy different pelagic and epibenthic habitats over the course of a year, the up-dated EFH designations (maps and texts) apply separately to sub-

adult males, sub-adult females, adult males, and adult females.[13] Additionally, EFH would be specified for juveniles (males and females less than or equal to 35 cm). The revised maps would define EFH according to the ten minute squares that account for the 90th percentile of the mean catch by square from the last 30 years of the NEFSC spring and fall trawl surveys, but would also include presence of spiny dogfish (>10% of samples) in state and other inshore survey catches. The 90th percentile in the spatial analysis is an inclusive threshold that is used to account for inter-year variability as well as the large north-south and inshore-offshore movements undertaken by spiny dogfish in a given year. These spatial depictions of spiny dogfish distributions as well as the revised text descriptions of EFH would comprise the EFH designation for each of the life stages.

To the degree that spiny dogfish EFH is adversely affected by fishing and/or non-fishing activities, management oversight of these activities in areas designated as EFH for a given life stage would allow for indirect benefits for the spiny dogfish resource compared to the no action alternative since any NMFS EFH consultation would more appropriately reflect current spiny dogfish EFH. Alternative 2B identifies EFH for five life stages of spiny dogfish based upon updated spatial distribution data derived from a range of fishery independent sampling programs and up-dated habitat-related information.

The net effect of the up-dated designations is a partitioning of the original two broadly-defined size-specific EFH maps into five more narrowly-defined EFH areas. A single map that originally defined the geographic extent of EFH for males less than 60 cm in length and females less than 83 cm over most of the region (see Figure 1) has been partitioned into three maps, one for male and female juveniles less than or equal to 35 cm and individual maps for sub-adult males (36 – 59 cm) and another for females (36 – 79 cm). The revised maps clearly differentiate between EFH for the three life stages, especially the sub-adult males and females (see Figures 6 and 7).[14] The up-dated maps for adult males and females also include fewer ten minute squares than the combined status quo adult map, but are much more similar to each other than the sub-adult maps.[15] Areas such as the shallower portion of Georges Bank and the outer Gulf of Maine would no longer be EFH for adult females. Also removed from the proposed new designations is the large area on the continental shelf south of Cape Hatteras that was originally designated in the absence of any survey data. Because state survey data were added to the new maps, inshore areas that were not included in the original maps have been added (e.g., the coast of New Jersey). Since the fishery targets the larger female dogfish, future efforts to evaluate the effects of fishing activities on spiny dogfish EFH will be more focused on areas where female dogfish are more abundant. Potentially, therefore, the habitat impact of the new designations is positive because habitat protection efforts would be more effective. This conclusion also applies to non-fishing activities that could affect the suitability of water column habitats used by dogfish.

The breakdown of juvenile and adult dogfish into sex and length specific groupings also makes the EFH definitions consistent with the demographic components that are used in the stock

[13] Spiny dogfish make extensive seasonal migrations, but the habitats they occupy at one time of year can be just as important as the ones they occupy at another time of year so that on an annual basis, spring and fall spatial distributions and depth and temperature ranges are combined in the EFH designations.

[14] As pointed out in Section 5.2.1.2.1, state survey data that are available in southern New England and the Mid-Atlantic do not differentiate male and female dogfish, so a few ten minute squares (tms) appear twice, once in the male map and again in the female map. The same is true of the adult male and female maps. To see which tms are not specific to males and females, see Appendix A.

[15] The up-dated maps also include fewer tms because the NEFSC survey data were processed using a different method for transforming the data and for selecting the sub-set of tms that were mapped.

assessment for spiny dogfish and thus it may be possible, if a consultation were to be triggered, to link the potential for habitat impacts to specific components of the spiny dogfish stock. The various stock components are considered important in understanding the population dynamics of spiny dogfish. For example, the biological reference point for determining if spiny dogfish is overfished is based on the biomass of the mature female portion of the stock.

If a project were to be proposed that could potentially effect spiny dogfish EFH, then protection to any non-target, and protected resources contained in the designated EFH area could occur. The positive impacts associated with this protection would likely be very similar under the no action (2A) and action alternative (2B). For the managed resources, non-target species, habitat, and protected resources the protection afforded under Alternative 2B would be greater than 2A since the areas designated more closely align with likely current distributions of habitat and the managed resource. The low positive impacts to human communities from Alternative 2A or 2B are indirect and would occur in terms of benefits to the other VECs. These indirect low positive impacts to human communities are not differentiable among the alternatives but are considered to be greater under Alternative 3B compared to the No Action because 3B more closely aligns with likely current distributions of habitat and the managed resource.

7.3 DELAYED IMPLEMENTATION OF THE COMMERCIAL QUOTA

Alternatives: 3A: No action
3B: (Preferred) Maintain Previous Year Quota until Effective Date for New Quota

Under the current FMP, if the effective date for the final rule is delayed beyond the start of the new fishing year (May 1), the previous year's daily possession limit is maintained in the regulations; however, the fishery operates without a commercial quota. This would be maintained under Alternative 3A while Alternative 3B would correct this. The only conceivable impact this would have is to prevent a run-away fishery from landing more than the annual quota during the window from the start of the fishing year (May 1) and the effective date for the new quota. This is a highly unlikely scenario given that daily possession limits would be maintained and landings would occur in the jurisdiction of the states where state and/or regional harvest limits would be in place. Because this is a primarily administrative alternative, there are no direct environmental impacts associated with alternative 3B when compared to the no action. There is the potential that no action could result in overfishing, however, this is remote since it would necessitate that the Councils not specify a quota in a given year. Under such a scenario, the overfishing would result in low negative impacts to the managed resource and non-target species. Therefore, some low positive impacts to the managed resource and non-target species are possible under Alternative 3B if it prevents overfishing.

7.4 COMMERCIAL QUOTA ALLOCATION SCHEME

Alternatives: 4A: No action (Maintain existing two-period seasonal allocation scheme)
4B: (Preferred) Eliminate Allocation of Commercial Quota
4C: Establish Geographic Allocation of the Commercial Quota Identical to that Currently In Place under the ASMFC Plan

Under the no action/status quo, where the federal quota is divided up into two six-month periods, the periods serve to prevent the entire quota from being landed in the first six months of the fishing year (Table 21). This was initially put in place when the rebuilding plan for spiny dogfish was implemented to prevent states in the north from harvesting the then very small bycatch quota (4 M lb) before the resource became available to states in the south (Table 22). This indirect route to regional allocation of the quota was circumvented when the ASFMC explicitly allocated the coastwide quota among regions (Addendum II; ASMFC 2008) and later among a mix of states and regions (Addendum III; ASMFC 2011). Since then, there have been numerous instances in which the either federal waters are open after a state has closed its fishery or state waters are open after federal waters have closed. The ASMFC and NMFS have attempted to coordinate their closure announcements to minimize confusion, but have not always been successful.

A perpetuation of the confusion and conflict would occur under the no action alternative (4A). Added to that is the potential for inadvertent possession violations that occurs when waters under the different jurisdictions are open / closed at different times. Therefore, the no action would have slight negative socio/economic impacts and null impacts to the managed resource, non-target species, habitat, and protected resources

Either of the action alternatives is expected to alleviate the confusion. The impacts of the action alternatives under this issue are primarily socio-economic and positive because eliminating the potential conflicts in the allocation schemes would benefit participants in the respective fisheries. By removing potential conflicting regulations, alternative 4B would produce neutral or positive impacts for small entities. Impacts to managed resources, non-target species, habitat, and protected resources are already accounted for in setting the annual quota and are not expected to change since any such change would likely be tied to a shift in the geographic distribution of fishing effort which is not expected. The action alternatives would achieve the same outcome except that if Alternative 4C is adopted and further modification to the Interstate FMP occurs, the plans would again be inconsistent.

For all VECs except human communities, the impacts of all of the alternatives is null compared to the no action because the distribution and magnitude of overall effort is not expected to be different under any other the alternatives. Other considerations relate to the potential for different coastwide quotas under the two plans (Table 23).

Table 22. Fishing year (May 1 – Apr 30) landings since 2000 by Period where Period 1 is May 1 – Oct 31 and Period 2 is Nov 1 – Apr 30.

FISHING YEAR	PERIOD 1 LANDINGS (LB)	PERIOD 2 LANDINGS (LB)	TOTAL LANDINGS (LB)	PCT PERIOD 1	PCT PERIOD 2
2000	7,709,445	455,143	8,164,588	94.4%	5.6%
2001	2,584,100	2,437,448	5,021,548	51.5%	48.5%
2002	3,052,858	1,710,363	4,763,221	64.1%	35.9%
2003	2,367,790	818,340	3,186,130	74.3%	25.7%
2004	988,508	387,137	1,375,645	71.9%	28.1%
2005	1,903,641	488,601	2,392,242	79.6%	20.4%
2006	2,476,141	4,106,545	6,582,686	37.6%	62.4%
2007	4,073,393	2,317,910	6,391,303	63.7%	36.3%
2008	5,470,534	3,534,893	9,005,427	60.7%	39.3%
2009	7,865,311	4,071,729	11,937,040	65.9%	34.1%
2010	8,830,401	5,693,392	14,523,793	60.8%	39.2%
2011	12,930,548	7,330,471	20,261,019	63.8%	36.2%
2012	15,906,065	10,855,923	26,761,988	59.4%	40.6%

Table 23. Fishing year (May 1 – Apr 30) landings since 2000 by "Region' defined as "North" (ME – CT) and "South" (NY-NC)

FISHING YEAR	NORTH LANDINGS (LB)	SOUTH LANDINGS (LB)	TOTAL LANDINGS (LB)	PCT NORTH	PCT SOUTH
2000	7,966,598	197,990	8,164,588	97.6%	2.4%
2001	4,781,321	240,227	5,021,548	95.2%	4.8%
2002	4,610,294	152,927	4,763,221	96.8%	3.2%
2003	2,287,919	898,211	3,186,130	71.8%	28.2%
2004	1,286,974	88,671	1,375,645	93.6%	6.4%
2005	2,270,204	122,038	2,392,242	94.9%	5.1%
2006	4,137,037	2,445,649	6,582,686	62.8%	37.2%
2007	3,625,164	2,766,139	6,391,303	56.7%	43.3%
2008	5,209,955	3,795,472	9,005,427	57.9%	42.1%
2009	7,560,207	4,376,833	11,937,040	63.3%	36.7%
2010	8,700,089	5,823,704	14,523,793	59.9%	40.1%
2011	12,516,128	7,744,891	20,261,019	61.8%	38.2%
2012	17,097,715	9,664,413	26,761,988	63.9%	36.1%

Table 24. Potential impacts to human communities under the different quota allocation schemes

Scenario	Same Quota	Larger ASMFC Quota	Larger Federal Quota
Alt 4A (status quo)	**Negative**: Harvest of the Period 1 quota shuts down federal waters outside states that have not yet harvested their allocation	**Negative**: Vessels with federal permits have to drop their open access federal permits to fish in state waters	**Neutral:** If a region or state announces a closure, federal permit holders have to land spiny dogfish in other states that remain open if that is possible
Alt 4B (coastwide quota)	**Positive**: States will close each region/state as the region/state quota is filled, and the federal and interstate fishery will close when the total coast-wide quota is filled	**Negative, but unlikely** (Only if the ASMFC quota is much larger) - Northern states could harvest the entire federal coastwide quota before the spiny dogfish move south in the winter and southern states fully harvest their fisheries. This would cause vessels in southern states to relinquish their Federal permits and fish only in state waters	**Neutral:** If a region or state announces a closure, federal permit holders have to land spiny dogfish in other states that remain open if that is possible
Alt 4C (match ASMFC state/regional allocation)	**Positive**: States will close each region/state as the region/state quota is filled, and the federal and interstate fishery will close when the total coast-wide quota is filled	**Negative**: Vessels with federal permits have to drop their open access federal permits to fish in state waters	**Neutral:** If a region or state announces a closure, federal permit holders have to land spiny dogfish in other states that remain open if that is possible

7.5 Cumulative Effects Analysis

A cumulative effects analysis (CEA) is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The purpose of CEA is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful. A formal cumulative impact assessment is not necessarily required as part of an EA under NEPA as long as the significance of cumulative impacts have been considered (U.S. EPA 1999). The following remarks address the significance of the expected cumulative impacts as they relate to the federally managed spiny dogfish fishery.

7.5.1 Consideration of the VECs

In section 6.0 (Description of the Affected Environment), the VECs that exist within the spiny dogfish fishery environment are identified. Therefore, the significance of the cumulative effects will be discussed in relation to the VECs listed below.

1. Managed resource (spiny dogfish)
2. Non-target species
3. Habitat including EFH for the managed resource and non-target species
4. ESA listed and MMPA protected species
5. Human communities

7.5.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the harvest of spiny dogfish. The core geographic scope for each of the VECs is focused on the Western Atlantic Ocean (section 6.0). The core geographic scopes for the managed resources are the range of the management units (section 6.1). For non-target species, those ranges may be expanded and would depend on the managed resource and non-target species range of each individual non-target species in the Western Atlantic Ocean. For habitat, the core geographic scope is focused on EFH within the EEZ but includes all habitat utilized by spiny dogfish and non-target species in the Western Atlantic Ocean. The core geographic scope for endangered and protected resources can be considered the overall range of these VECs in the Western Atlantic Ocean. For human communities, the core geographic boundaries are defined as those U.S. fishing communities directly involved in the harvest or processing of the managed resources, which were found to occur in coastal states from Maine through North Carolina (section 6.4).

7.5.3 Temporal Boundaries

The temporal scope of past and present actions for VECs is primarily focused on actions that have occurred after FMP implementation (1990). For endangered and other protected resources, the scope of past and present actions is on a species-by-species basis (section 6.3) and is largely focused on the 1980s and 1990s through the present, when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ. The temporal scope of future actions for all five VECs extends about three years (2016) into the future. This period was chosen because the dynamic nature of resource management and lack of information on projects that may occur in the future make it very difficult to predict impacts beyond this timeframe with any certainty.

7.5.4 Actions Other Than Those Proposed in this Amendment

The impacts of each of the alternatives considered in this specifications document are given in section 7.1 through 7.4. Table 25 presents meaningful past (P), present (Pr), or reasonably foreseeable future (RFF) actions to be considered other than those actions being considered in this specifications document. These impacts are described in chronological order and qualitatively, as the actual impacts of these actions are too complex to be quantified in a meaningful way. When any of these abbreviations occur together (i.e., P, Pr, RFF), it indicates that some past actions are still relevant to the present and/or future actions.

Past and Present Actions

The historical management practices of the Council have resulted in positive impacts on the health of the spiny dogfish stock (section 6.1). Actions have been taken to manage the commercial fisheries for this species through amendment actions. In addition, the annual specifications process is intended to provide the opportunity for the Council and NMFS to regularly assess the status of the fishery and to make necessary adjustments to ensure that there is a reasonable expectation of meeting the objectives of the FMP. The statutory basis for federal fisheries management is the MSA. To the degree with which this regulatory regime is complied, the cumulative impacts of past, present, and reasonably foreseeable future federal fishery management actions on the VECs should generally be associated with positive long-term outcomes. Constraining fishing effort through regulatory actions can often have negative short-term socioeconomic impacts. These impacts are usually necessary to bring about long-term sustainability of a given resource, and as such, should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the spiny dogfish stock.

Non-fishing activities that introduce chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment pose a risk to all of the identified VECs. Human-induced non-fishing activities tend to be localized in nearshore areas and marine project areas where they occur. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities. The overall impact to the affected species and its habitat on a population level is unknown, but likely neutral to low negative, since a large portion of this species has a limited or minor exposure to these local non-fishing perturbations.

In addition to guidelines mandated by the MSA, NMFS reviews these types of effects through the review processes required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by federal, state, and local authorities. The jurisdiction of these activities is in "waters of the U.S." and includes both riverine and marine habitats.

Reasonably Foreseeable Future Actions

For many of the proposed non-fishing activities to be permitted under other federal agencies (such as beach nourishment, offshore wind facilities, etc.), those agencies would conduct examinations of potential impacts on the VECs. The MSA (50 CFR 600.930) imposes an obligation on other federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH. The eight Fishery Management Councils are engaged in this review process by making comments and recommendations on any federal or state action that may affect habitat, including EFH, for their managed species and by commenting on actions likely to substantially affect habitat, including EFH.

In addition, under the Fish and Wildlife Coordination Act (Section 662), "whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the U.S., or by any public or private agency under federal permit or license, such department or agency first shall consult with the U.S. Fish and Wildlife Service (USFWS), Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular state wherein the" activity is taking place. This act provides another avenue for review of actions by other federal and state agencies that may impact resources that NMFS manages in the reasonably foreseeable future.

In addition, NMFS and the USFWS share responsibility for implementing the ESA. ESA requires NMFS to designate "critical habitat" for any species it lists under the ESA (i.e., areas that contain physical or managed resource and non-target species features essential to conservation, which may require special management considerations or protection) and to develop and implement recovery plans for threatened and endangered species. The ESA provides another avenue for NMFS to review actions by other entities that may impact endangered and protected resources whose management units are under NMFS' jurisdiction.

7.5.5 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative effects, the additive and synergistic effects of the proposed action, as well as past, present, and future actions, must be taken into account. The following section discusses the effects of these actions on each of the VECs.

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Table 25. Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this specifications document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
P, Pr Original FMP and subsequent Amendments and Frameworks to the FMP	Established commercial management measures	**Indirect Positive** Regulatory tool available to rebuild and manage stocks	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Benefited domestic businesses
P, Pr Spiny dogfish Specifications	Establish annual quotas, trip limits	**Indirect Positive** Regulatory tool to specify catch limits, and other regulation; allows response to annual stock updates	**Indirect Positive** Reduced effort levels and gear requirements	**Indirect Positive** Reduced effort levels and gear requirements	**Indirect Positive** Reduced effort levels and gear requirements	**Indirect Positive** Benefited domestic businesses
P, Pr Developed and Applied Standardized Bycatch Reporting Methodology	Established acceptable level of precision and accuracy for monitoring of bycatch in fisheries	**Neutral** May improve data quality for monitoring total removals of managed resource	**Neutral** May improve data quality for monitoring removals of non-target species	**Neutral** Will not affect distribution of effort	**Neutral** May increase observer coverage and will not affect distribution of effort	**Potentially Indirect Negative** May impose an inconvenience on vessel operations
Pr, RFF Omnibus Amendment ACLs/AMs Implemented	Establish ACLs and AMs for all three plan species	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis
P, Pr, RFF Agricultural runoff	Nutrients applied to agricultural land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource
P, Pr, RFF Port maintenance	Dredging of coastal, port and harbor areas for port maintenance	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Direct Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects

Table 25 (Continued). Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this specifications document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
P, Pr, RFF Offshore disposal of dredged materials	Disposal of dredged materials	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource viability
P, Pr, RFF Beach nourishment	Offshore mining of sand for beaches	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for mining companies, possibly negative for fishing industry
	Placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Positive** Beachgoers like sand; positive for tourism
P, Pr, RFF Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for some interests, potential displacement for others
P, Pr, RFF Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Direct Negative** Reduced habitat quality	**Potentially Direct Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects

Table 25 (Continued). Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this specifications document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
RFF Offshore Wind Energy Facilities (within 3 years)	Construction of wind turbines to harness electrical power	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
Pr, RFF Liquefied Natural Gas (LNG) terminals (within 3 years)	Transport natural gas via tanker to terminals offshore and onshore	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
RFF Convening Gear Take Reduction Teams (within next 3 years)	Recommend measures to reduce mortality and injury to marine mammals	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce bycatch	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues
RFF Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (w/in next 3 years)	May recommend strategies to prevent the bycatch of sea turtles in commercial fisheries operations	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce bycatch	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues

7.5.5.1 Managed Resources

Those past, present, and reasonably foreseeable future actions, whose effects may impact the managed resources and the direction of those potential impacts, are summarized in Table 25. The indirectly negative actions described in Table 25 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on the managed resource is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of the managed resources is unquantifiable. As described above (section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on the managed resource. It is anticipated that the future management actions, described in Table 26, will result in additional indirect positive effects on the managed resources through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services on which spiny dogfish productivity depends. The 2012 fishing year was the first year of implementation for an Amendment that requires specification of ACLs/AMs and catch accountability. This represented a major change to the previous management program and would be expected to lead to improvements in resource sustainability over the long-term. The impacts from this change should be broad in temporal scope and across FMPs and have yet to manifest themselves fully for the dogfish fishery since harvest above the ACL has not occurred. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to spiny dogfish have had a positive cumulative effect.

Commercial quotas for the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts from annual specification of management measures established in previous years on the managed resource are largely dependent on how effective those measures were in meeting their intended objectives (i.e., preventing overfishing, achieve OY) and the extent to which mitigating measures were effective. The proposed actions in this document have impacts that range from neutral to positive impacts and would positively reinforce the past and anticipated positive cumulative effects on the spiny dogfish stock, by achieving the objectives specified in the FMP. Therefore, the proposed action would not have any significant effect on the managed resources individually or in conjunction with other anthropogenic activities (see Table 26).

Table 26. Summary of the effects of past, present, and reasonably foreseeable future actions on the managed resource.

Action	Past to the Present	Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**	
Spiny dogfish Specifications	**Indirect Positive**	
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**	
Amendment to address ACLs/AMs implemented		**Potentially Indirect Positive**
Agricultural runoff	**Indirect Negative**	
Port maintenance	**Uncertain – Likely Indirect Negative**	
Offshore disposal of dredged materials	**Indirect Negative**	
Beach nourishment – Offshore mining	**Indirect Negative**	
Beach nourishment – Sand placement	**Indirect Negative**	
Marine transportation	**Indirect Negative**	
Installation of pipelines, utility lines and cables	**Uncertain – Likely Indirect Negative**	
National Offshore Aquaculture Act of 2007	**Potentially Indirect Negative**	
Offshore Wind Energy Facilities (within 3 years)		**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)		**Uncertain – Likely Indirect Negative**
Convening Gear Take Reduction Teams (within 3 years)		**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)		**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on the managed resources * See section 7.5.5.1 for explanation.**	

7.5.5.2 Non-Target Species or Bycatch

Those past, present, and reasonably foreseeable future actions, whose effects may impact non-target species and the direction of those potential impacts, are summarized in Table 25. The effects of indirectly negative actions described in Table 25 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on non-target species is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of non-target resources and the oceanic ecosystem is unquantifiable. As described above (section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. At this time, NMFS can consider impacts to non-target species (federally-managed or otherwise) and comment on potential impacts. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources within NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on non-target species. Implementation and application of a standardized bycatch reporting methodology would have a particular impact on non-target species by improving the methods which can be used to assess the magnitude and extent of a potential bycatch problem. Better assessment of potential bycatch issues allows more effective and specific management measures to be developed to address a bycatch problem. It is anticipated that future management actions, described in Table 27, will result in additional indirect positive effects on non-target species through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services on which the productivity of many of these non-target resources depend. The impacts of these future actions could be broad in scope, and it should be noted the managed resource and non-target species are often coupled in that they utilize similar habitat areas and ecosystem resources on which they depend. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful have had a positive cumulative effect on non-target species.

Commercial quotas and trip limits for the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The proposed actions in this document have impacts that range from neutral to positive impacts, and would not change the past and anticipated positive cumulative effects on non-target species and thus, would not have any significant effect on these species individually or in conjunction with other anthropogenic activities (Table 27).

Table 27. Summary of the effects of past, present, and reasonably foreseeable future actions on the non-target species.

Action	Past to the Present		Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**		
Spiny dogfish Specifications	**Indirect Positive**		
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**		
Amendment to address ACLs/AMs implemented		**Potentially Indirect Positive**	
Agricultural runoff	**Indirect Negative**		
Port maintenance	**Uncertain – Likely Indirect Negative**		
Offshore disposal of dredged materials	**Indirect Negative**		
Beach nourishment – Offshore mining	**Indirect Negative**		
Beach nourishment – Sand placement	**Indirect Negative**		
Marine transportation	**Indirect Negative**		
Installation of pipelines, utility lines and cables	**Uncertain – Likely Indirect Negative**		
National Offshore Aquaculture Act of 2007	**Potentially Indirect Negative**		
Offshore Wind Energy Facilities (within 3 years)			**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)		**Uncertain – Likely Indirect Negative**	
Convening Gear Take Reduction Teams (within 3 years)			**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)			**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on the non-target species** *** See section 7.5.5.2 for explanation.**		

7.5.5.3 Habitat (Including EFH)

Those past, present, and reasonably foreseeable future actions, whose effects may impact habitat (including EFH) and the direction of those potential impacts, are summarized in Table 25. The direct and indirect negative actions described in Table 25 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on habitat is expected to be limited due to a lack of exposure to habitat at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on habitat and EFH is unquantifiable. As described above (section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources and the habitat on which they rely prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of direct and indirect negative impacts those actions could have on habitat utilized by resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on habitat and EFH. The actions have constrained fishing effort at a large scale and locally, and have implemented gear requirements, which may reduce habitat impacts. As required under these FMP actions, EFH and HAPCs were designated for the managed resources. It is anticipated that the future management actions, described in Table 28, will result in additional direct or indirect positive effects on habitat through actions which protect EFH for federally-managed species and protect ecosystem services on which these species' productivity depends. These impacts could be broad in scope. All of the VECs are interrelated; therefore, the linkages among habitat quality and EFH, managed resources and non-target species productivity, and associated fishery yields should be considered. For habitat and EFH, there are direct and indirect negative effects from actions which may be localized or broad in scope; however, positive actions that have broad implications have been, and it is anticipated will continue to be, taken to improve the condition of habitat. There are some actions, which are beyond the scope of NMFS and Council management such as coastal population growth and climate changes, which may indirectly impact habitat and ecosystem productivity. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to habitat have had a neutral to positive cumulative effect.

Commercial quotas and trip limits for the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The proposed actions in this document would not change the past and anticipated cumulative effects on habitat and thus, would not have any significant effect on habitat individually or in conjunction with other anthropogenic activities (Table 28).

Table 28. Summary of the effects of past, present, and reasonably foreseeable future actions on the habitat.

Action	Past to the Present		Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**		
Spiny dogfish Specifications	**Indirect Positive**		
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**		
Amendment to address ACLs/AMs implemented		**Potentially Indirect Positive**	
Agricultural runoff	**Direct Negative**		
Port maintenance	**Uncertain – Likely Direct Negative**		
Offshore disposal of dredged materials	**Direct Negative**		
Beach nourishment – Offshore mining	**Direct Negative**		
Beach nourishment – Sand placement	**Direct Negative**		
Marine transportation	**Direct Negative**		
Installation of pipelines, utility lines and cables	**Uncertain – Likely Direct Negative**		
National Offshore Aquaculture Act of 2007	**Direct Negative**		
Offshore Wind Energy Facilities (within 3 years)			**Potentially Direct Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)		**Potentially Direct Negative**	
Convening Gear Take Reduction Teams (within 3 years)			**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)			**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, neutral to positive impacts on habitat, including EFH * See section 7.5.5.3 for explanation.**		

7.5.5.4 ESA Listed and MMPA Protected Species

Those past, present, and reasonably foreseeable future actions, whose effects may impact the protected resources and the direction of those potential impacts, are summarized in Table 25. The indirectly negative actions described in Table 25 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on protected resources, relative to the range of many of the protected resources, is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on protected resources either directly or indirectly is unquantifiable. As described above (section 7.5.4), NMFS has several means, including ESA, under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' protected resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on protected resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on ESA listed and MMPA protected species through the reduction of fishing effort (potential interactions) and implementation of gear requirements. It is anticipated that the future management actions, specifically those recommended by the ALWTRT and the development of strategies for sea turtle conservation described in Table 29, will result in additional indirect positive effects on the protected resources. These impacts could be broad in scope. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to protected resources have had a positive cumulative effect.

Commercial quotas and trip limits for the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The proposed actions in this document have impacts that range from neutral to positive impacts and would not change the past and anticipated cumulative effects on ESA listed and MMPA protected species and thus, would not have any significant effect on protected resources individually or in conjunction with other anthropogenic activities (Table 29).

Table 29. Summary of the effects of past, present, and reasonably foreseeable future actions on the protected resources.

Action	Past to the Present		Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**		
Spiny dogfish Specifications	**Indirect Positive**		
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**		
Amendment to address ACLs/AMs implemented		**Potentially Indirect Positive**	
Agricultural runoff	**Indirect Negative**		
Port maintenance	**Uncertain – Likely Indirect Negative**		
Offshore disposal of dredged materials	**Indirect Negative**		
Beach nourishment – Offshore mining	**Indirect Negative**		
Beach nourishment – Sand placement	**Indirect Negative**		
Marine transportation	**Indirect Negative**		
Installation of pipelines, utility lines and cables	**Potentially Direct Negative**		
National Offshore Aquaculture Act of 2007	**Potentially Indirect Negative**		
Offshore Wind Energy Facilities (within 3 years)			**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)		**Uncertain – Likely Indirect Negative**	
Convening Gear Take Reduction Teams (within 3 years)			**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)			**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on protected resources** *** See section 7.5.5.4 for explanation.**		

7.5.5.5 Human Communities

Those past, present, and reasonably foreseeable future actions, whose effects may impact human communities and the direction of those potential impacts, are summarized in Table 25. The indirectly negative actions described in Table 25 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on human communities is expected to be limited in scope. It may, however, displace fishermen from project areas. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude. This may result in indirect negative impacts on human communities by reducing resource availability; however, this effect is unquantifiable. As described above (section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on human communities.

Past fishery management actions taken through the FMP and annual specification process have had both positive and negative cumulative effects by benefiting domestic fisheries through sustainable fishery management practices, while at the same time potentially reducing the availability of the resource to all participants. Sustainable management practices are, however, expected to yield broad positive impacts to fishermen, their communities, businesses, and the nation as a whole. It is anticipated that the future management actions, described in Table 30, will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on the human communities could occur through management actions that may implement gear requirements or area closures and thus, reduce revenues. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had an overall positive cumulative effect.

Commercial quotas, trip limits, and other management actions related to the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts from actions established in previous years on the managed resources are largely dependent on how effective those measures were in meeting their intended objectives and the extent to which mitigating measures were effective.

There is the potential for neutral to positive short-term effects on human communities from the proposed action and the expectation is that there would be a positive long-term effect on human communities due to the long-term sustainability of spiny dogfish. The proposed actions in this document have impacts that range from neutral to positive impacts and would not change the past and anticipated cumulative effects on human communities and thus, would not have any significant effect on human communities individually, or in conjunction with other anthropogenic activities (Table 30).

Table 30. Summary of the effects of past, present, and reasonably foreseeable future actions on human communities.

Action	Past to the Present	Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**	
Spiny dogfish Specifications	**Indirect Positive**	
Developed and Implement Standardized Bycatch Reporting Methodology	**Potentially Indirect Negative**	
Amendment to address ACL/AMs implemented		**Potentially Indirect Positive**
Agricultural runoff	**Indirect Negative**	
Port maintenance	**Uncertain – Likely Mixed**	
Offshore disposal of dredged materials	**Indirect Negative**	
Beach nourishment – Offshore mining	**Mixed**	
Beach nourishment – Sand placement	**Positive**	
Marine transportation	**Mixed**	
Installation of pipelines, utility lines and cables	**Uncertain – Likely Mixed**	
National Offshore Aquaculture Act of 2007	**Uncertain – Likely Mixed**	
Offshore Wind Energy Facilities (within 3 years)		**Uncertain – Likely Mixed**
Liquefied Natural Gas (LNG) terminals (within 3 years)	**Uncertain – Likely Mixed**	
Convening Gear Take Reduction Teams (within 3 years)		**Indirect Negative**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)		**Indirect Negative**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on human communities** *** See section 7.5.5.5 for explanation.**	

7.5.6 Preferred Action on all the VECs

The Council has identified its preferred action alternatives in section 5.0. The cumulative effects of the range of actions considered in this document can be considered to make a determination if significant cumulative effects are anticipated from the preferred action.

The direct and indirect impacts of the proposed actions on the VECs are described in sections 7.1 through 7.4. The magnitude and significance of the cumulative effects, which include the additive and synergistic effects of the proposed action, as well as past, present, and future actions, have been taken into account throughout this section 7.5. The action proposed in this amendment builds off action taken in the original FMP and subsequent amendments and framework documents. When this action is considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative. Based on the information and analyses presented in these past FMP documents and this document, there are no significant cumulative effects associated with the action proposed in this document (Table 31).

Table 31. Magnitude and significance of the cumulative effects; the additive and synergistic effects of the preferred action, as well as past, present, and future actions.

VEC	Status in 2011	Net Impact of P, Pr, and RFF Actions	Impact of the Preferred Actions	Significant Cumulative Effects
Managed Resource	Complex and variable (Section 6.1)	Positive (Sections 7.5.4 and 7.5.5.1)	Neutral to Positive (Sections 7.1-7.4)	**None**
Non-target Species	Complex and variable (Section 6.1)	Positive (Sections 7.5.4 and 7.5.5.2)	Neutral to Positive (Sections 7.1-7.4)	**None**
Habitat	Complex and variable (Section 6.2)	Neutral to positive (Sections 7.5.4 and 7.5.5.3)	Neutral to Positive (Sections 7.1-7.4)	**None**
Protected Resources	Complex and variable (Section 6.3)	Positive (Sections 7.5.4 and 7.5.5.4)	Neutral to Positive (Sections 7.1-7.4)	**None**
Human Communities	Complex and variable (Section 6.4)	Positive (Sections 7.5.4 and 7.5.5.5)	Neutral to Positive (Sections 7.1-7.4)	**None**

8.0 APPLICABLE LAWS

8.1 Magnuson-Stevens Fishery Conservation and Management Act (MSA) and National Standards

Section 301 of the MSA requires that FMPs contain conservation and management measures that are consistent with the ten National Standards. The most recent FMP amendments for the managed resources address how the management actions comply with the National Standards. First and foremost, the Council continues to meet the obligations of National Standard 1 by adopting and implementing conservation and management measures that will continue to prevent overfishing, while achieving, on a continuing basis, the optimum yield for the managed resources and the U.S. fishing industry.

This action was developed to amend several administrative aspects of the Spiny Dogfish FMP; therefore, the Council has identified measures, which, when taken in conjunction with existing measures, would maintain compliance with all National Standards. The avoidance of overfishing is not diminished by these actions and OY can be achieved in this fishery (National Standard 1). The Council uses the best scientific information available in defining EFH for spiny dogfish (National Standard 2). The Council manages the resource throughout its range (National Standard 3) and this action does not alter the management unit or management jurisdictions for the resource. These measures do not discriminate among residents of different states (National Standard 4) because they are applied to the fishery as a whole. The positive impacts that result from preventing overfishing and achieving OY should be maintained and realized by all fishery participants, irrespective of state of residency. The actions taken within this document do not have economic allocation as their sole purpose (National Standard 5). These measures account for variations in the fishery (National Standard 6) by allowing access to the fishery until the quota has been achieved in a given year. This action is not associated with unnecessary duplication (National Standard 7). This action would not impose or result in any changes to fishing operations, fishing behavior, fishing gears used, or areas fished, and; therefore, should not alter the manner in which fishing communities participant in the fishery. This action considers fishing communities (National Standard 8) in that it minimizes conflicts with state specific fisheries which would provide social and economic benefits. The proposed actions are consistent with National Standard 9, because the proposed measures consider all components of the catch, including bycatch. Finally, this action does not propose any measures that would affect safety at sea (National Standard 10).

The Council has implemented many regulations that have indirectly acted to reduce fishing gear impacts on EFH. By continuing to meet the National Standards requirements of the MSA through future FMP amendment, FMP framework adjustment, and specifications, the Council will ensure that cumulative impacts of these actions will remain positive overall for the ports and communities that depend on these fisheries, the Nation as a whole, and certainly for the resources.

8.2 National Environmental Policy Act of 1969 (NEPA)

8.2.1 Finding of No Significant Environmental Impact (FONSI)

National Oceanic and Atmospheric Administration Administrative Order (NAO) 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1) Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?

The proposed action is largely administrative and, as such, is not expected to jeopardize the sustainability of the target species. As discussed in Section 6.1.2, the spiny dogfish stock is rebuilt, is not overfished, and overfishing is not occurring.

2) Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species?

The proposed action is not expected to jeopardize the sustainability of any non-target species (Sections 7.1 - 7.4). The proposed measure is not expected to significantly alter fishing methods or activities. The proposed actions should not significantly increase directed dogfish fishing in the EEZ. As such, the incidental catch of non-target species should not increase significantly.

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?

The proposed action is not expected to cause substantial damage to the ocean, coastal habitats, and/or EFH as defined under the MSA and identified in the FMP, but rather will provide improvements to EFH designations (Sections 7.1 - 7.4). The proposed EFH update should more accurately define habitat associations for spiny dogfish, allow for more appropriate consultation on potential spiny dogfish habitat impacts in the future.

4) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?

No changes in fishing behavior that would affect safety are anticipated. The overall effect of the proposed action would not adversely impact public health or safety.

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

The proposed actions are largely administrative and are not reasonably expected to have an adverse impact on endangered or threatened species, marine mammals, or critical habitat for these species (Sections 7.1 - 7.4). Measures in place to protect endangered or threatened species, marine mammals, and critical habitat for these species would remain in place.

6) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

The proposed actions are largely administrative and are not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. The action is not expected to alter fishing methods or activities or fishing effort or the spatial and/or temporal distribution of current fishing effort.

7) Are significant social or economic impacts interrelated with natural or physical environmental effects?

There are no significant social and economic impacts of the Proposed Action that are interrelated with natural or physical environmental effects. As discussed in Sections 7. 0 to Section 7,4 and Section 7.5.5. 5 the Proposed Action would have small positive social and economic impacts as a result of RSA due to indirect improvement in stock management. Additionally, the commercial quota allocation scheme would provide small positive impacts as it would better align the timing of federal and interstate closures.

8) Are the effects on the quality of the human environment likely to be highly controversial?

The impacts of the proposed measures on the human environment are described in Section 7 of the EA. The proposed actions merely adjust several administrative aspects of the Spiny Dogfish FMP. The proposed EFH definition is based on best available science. Therefore, the measures contained in this action are not expected to be highly controversial.

9) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

Although it is possible that historic or cultural resources such as shipwrecks could be present in the area where the spiny dogfish fishery is prosecuted, vessels try to avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. The proposed action is not likely to change fishing behavior with respect to unique areas. Therefore, it is not likely that the proposed action would result in substantial impacts to unique areas.

10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

The impacts of the proposed action on the human environment are described in Section 7.0 of the EA. The proposed action is not expected to alter fishing methods or activities, and is not expected to increase fishing effort or the spatial and/or temporal distribution of current fishing

effort. The measures contained in this action are not expected to have highly uncertain, unique, or unknown risks on the human environment.

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

As discussed in Section 7.5, the proposed action is not expected to have cumulatively significant impacts when considered with the impacts from other fishing and non-fishing activities. The improvements in the condition of the stock are expected to generate cumulative positive impacts overall. The proposed action, together with past and future actions are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment.

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

Although there are shipwrecks present in areas where fishing occurs, including some registered on the National Register of Historic Places, vessels try to avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. The proposed action is not likely to change fishing behavior with respect to historic resources. Therefore, it is not likely that the proposed action would adversely affect historic resources.

13) Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

There is no evidence or indication that this fishery has ever resulted in the introduction or spread of nonindigenous species. The proposed action is not expected to significantly alter fishing methods or activities, and is not expected to significantly increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Therefore, it is highly unlikely that the proposed action would be expected to result in the introduction or spread of a non-indigenous species.

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

The proposed action is not expected to alter fishing methods or activities, and is not expected to affect fishing effort or the spatial and/or temporal distribution of fishing effort. The proposed action will not result in significant effects, nor does it represent a decision in principle about a future consideration.

15) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

The proposed action is not expected to alter fishing methods or activities such that they threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. The proposed action has been found to be consistent with other applicable laws (see Sections 9.2 - 9.10 below).

16) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

The impacts of the proposed action on the biological, physical, and human environment are described in Section 7.0. The cumulative effects of the proposed action on target and non-target species are detailed in Section 7.6. The proposed action is not expected to increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Administrative improvements in the management of the stock through implementation of this amendment are expected to generate positive impacts overall.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment, it is hereby determined that the proposed actions in this amendment document will not significantly impact the quality of the human environment as described above and in the Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.

_____ _____

John K. Bullard Date
Regional Administrator, Greater Atlantic Region, NMFS

8.3 Marine Mammal Protection Act

The MAFMC has reviewed the impacts of Amendment 3 on marine mammals and has concluded that the amendment is consistent with the provisions of the MMPA, and will not alter existing measures to protect the species likely to inhabit the spiny dogfish management unit. For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see Section 7.4 of this document.

8.4 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing, or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NMFS ESA 7(d) memo dated August 28, 2012 determined that the spiny dogfish fishery could continue during ESA Section 7 consultation and not jeopardize Atlantic sturgeon populations. The MAFMC has concluded, using information available, that Amendment 3 is not likely to jeopardize any ESA-listed species or alter or modify any critical habitat, based on the discussion of impacts in this document (Section 7.4).

8.5 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972, as amended, provides measures for ensuring stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. The Council has developed Amendment 3 and will submit it to NMFS; NMFS must

determine whether this action is consistent to the maximum extent practicable with the CZM programs for each state (Maine through North Carolina).

8.6 Administrative Procedures Act

Sections 551-553 of the Federal Administrative Procedure Act establish procedural requirements applicable to informal rulemaking by federal agencies. The purpose is to ensure public access to the federal rulemaking process and to give the public notice and an opportunity to comment before the agency promulgates new regulations.

The Administrative Procedure Act requires solicitation and review of public comments on actions taken in the development of a fishery management plan and subsequent amendments and framework adjustments. Development of this specifications document provided many opportunities for public review, input, and access to the rulemaking process. The proposed actions in this amendment document were developed as a result of a multi-stage process that involved review of a public hearing document and draft amendment document by affected members of the public. The public had the opportunity to review and comment on the actions contemplated in the amendment during four scoping meetings in August 2009, several Mid-Atlantic and New England Council meetings (MAFMC - April 2009, June 2010, December 2010, April 2011, February 2012, April 2012, and October 2012; NEFMC - April 2012, September 2012). In addition, the public will have further opportunity to comment on this specifications package once NMFS publishes a proposed rule in the Federal Register (FR) requesting comments.

8.7 Section 515 (Data Quality Act)

Utility of Information Product

The action contained within this document was developed to be consistent with the FMPs, MSA, and other applicable laws, through a multi-stage process that was open to review by affected members of the public. The public had the opportunity to review and comment on these measures during the same meetings listed above in section 8.6. The public will have further opportunity to comment once NMFS publishes a request for comments on the proposed regulations in the *Federal Register*.

Integrity of Information Product

The information product meets the standards for integrity under the following types of documents: Other/Discussion (e.g., Confidentiality of Statistics of the MSA; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the Marine Mammal Protection Act).

Objectivity of Information Product

The category of information product that applies here is "Natural Resource Plans." This section (section 8.0) describes how this document was developed to be consistent with any applicable laws, including MSA and any of the applicable National Standards. The analyses used to develop the alternatives (i.e., policy choices) are based upon the best scientific information available and the most up to date information is used to develop the EA which evaluates the

impacts of those alternatives (see sections 5.0 and 7.0 of this document for additional details). The specialists who worked with these core data sets and population assessment models are familiar with the most recent analytical techniques and are familiar with the available data and information relevant to the spiny dogfish fishery.

The review process for this document involves the Council, the Northeast Fisheries Science Center (NEFSC), the Northeast Regional Office (NERO), and NMFS headquarters. The NEFSC technical review is conducted by senior level scientists with specialties in fisheries ecology, population dynamics and biology, as well as economics and social anthropology. The Council review process involves public meetings at which affected stakeholders have the opportunity to comments on proposed management measures. Review by NERO is conducted by those with expertise in fisheries management and policy, habitat conservation, protected resources, and compliance with the applicable law. Final approval of the Omnibus Amendment and clearance of the rule is conducted by staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

8.8 Paperwork Reduction Act

The Paperwork Reduction Act (PRA) concerns the collection of information. The intent of the PRA is to minimize the federal paperwork burden for individuals, small businesses, state and local governments, and other persons as well as to maximize the usefulness of information collected by the federal government. There are no changes to the existing reporting requirements previously approved under this FMP for vessel permits, dealer reporting, or vessel logbooks. This action does not contain a collection-of-information requirement for purposes of the Paperwork Reduction Act.

8.9 Impacts Relative to Federalism/E.O. 13132

This amendment does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order (EO) 13132.

8.10 Regulatory Flexibility Act/E.O. 12866

8.10.1 Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Analysis (IRFA)

This section provides the analysis and conclusions to address the requirements of Executive Order 12866 and the Regulatory Flexibility Act (RFA). Since many of the requirements of these mandates duplicate those required under the MSA and NEPA, this section contains references to other sections of this document. The following sections provide the basis for concluding that the proposed action is not significant under E.O. 12866 and will not have a significant economic impact on a substantial number of small entities under the RFA.

8.10.2 Description of Management Objectives

The goals and objectives of the management plan for the spiny dogfish resource are stated in Section 1.1.3 of the Spiny Dogfish FMP. The proposed action is consistent with, and does not modify those goals and objectives.

8.10.3 Description of the Fishery

Section 2.3 of the Spiny Dogfish FMP contains a detailed description of the historic spiny dogfish fishery. Updated fishery activity is given in Section 6.5 of this document.

8.10.4 Statement of the Problem

The purpose and need for this action is identified in Section 4.1 of this document. This Amendment to the Spiny Dogfish FMP addresses four problem areas:
Research Set-Aside (RSA): In 2001, all of the Council's FMPs were adjusted to allow for the set-aside of annual quota to support research and data collection. At the time the adjustment was developed, the Spiny Dogfish FMP was in development and was left out of that process. Thus the existing FMP does not allow for the benefits associated with the RSA program.

Essential Fish Habitat (EFH) Definitions for all Life Stages of Spiny Dogfish: In order for the plan to be fully compliant with the MSA, the EFH definitions must be reviewed every five years, and if necessary, updated. A review of the EFH definitions will be included in this amendment to keep the FMP compliant with the MSA. An optional update to the EFH definitions (Alt 2B) would base those definitions on data from a more recent timeframe.

Delayed Implementation of Commercial Quota at Start of New Fishing Year: Under the current FMP, if the effective date for the final rule is delayed beyond the start of the new fishing year (May 1), the previous year's daily possession limit is maintained in the regulations; however, the fishery operates without a commercial quota. In order to correct this, the FMP can be changed to keep in place all of the previous fishing year's management measures, including the quota, until they are replaced via rulemaking.

Commercial Quota Allocation Scheme: There are numerous problems that exist in the absence of a Joint Council and Commission FMP for spiny dogfish. One of these is confusion and the potential for inadvertent possession violations that occurs when waters under the different jurisdictions are open / closed at different times. This is largely due to a mismatch in the way the

annual quota is allocated. Under the Commission plan, the quota is geographically allocated, while under the federal plan, the quota is seasonally allocated. The federal FMP can be amended to minimize disruption of fishing operations that occur in both federal and state waters.

8.10.5 Description of the Alternatives

8.10.5.1 RSA Alternatives

Alternative 1A: No Action. (No RSA)
Under this alternative, the specification of management measures for spiny dogfish would continue without an option for the set-aside of commercial quota for research purposes.

For the two action alternatives under this issue, the current procedure followed by the Council and NMFS Northeast Regional Office (NERO) for specifying RSA would be followed. The difference between the two alternatives lies only in the maximum set-aside percentages allowed. Under either of the action alternatives, the FMP would identify an upper limit (either 3% or 5% of the annual spiny dogfish commercial quota) on the total research set-aside amount allowed in a given fishing year. Specification of RSA would be incorporated into the Council's quota specification package submitted to NMFS and the current procedure for requesting research proposals and approval of proposals would be followed.

Alternative 1B: Allowance for Allocation of up to 3% of Commercial Quota as RSA.
Under this alternative, the specification of management measures for spiny dogfish would include an option for the set-aside of up to 3% of the commercial quota for research purposes.

Alternative 1C: Allowance for Allocation of up to 5% of Commercial Quota as RSA
Under this alternative, the specification of management measures for spiny dogfish would include an option for the set-aside of up to 5% of the commercial quota for research purposes.

8.10.5.2 EFH Alternatives

Alternative 2A: No Action. (Do Not Update EFH Definitions for Spiny Dogfish)
Under this alternative, a mandatory review of EFH definitions for spiny dogfish would not be followed by modifications to those definitions. The definitions would remain as established in the original FMP.

Alternative 2B: Update EFH Definitions using Latest Biological Survey data

Under this alternative, the text and maps used to establish the EFH definitions for spiny dogfish would be updated to include federal and other biological survey data that have been collected in a more recent timeframe (through 2011). While collectively defining EFH for juveniles and adults as in the original EFH designations, maps associated with the update would break down the EFH definitions by sex to be consistent with differences in the distribution of male and female spiny dogfish by life stage. The definitions would continue to define EFH as 90% of the cumulative mean catch from the Northeast Fishery Science Center Trawl Catches, but would also include presence (>10% of samples) in state and other (NEAMAP, SEAMAP) survey catches. Maintaining the use of the 90^{th} percentile in the spatial analysis is used to account for inter-year variability as well as large north-south and inshore-offshore movements undertaken by spiny dogfish in a given year, as well as the revised text descriptions of EFH (indicated in Table 2)

together with the revised EFH maps would comprise the EFH designation for each of the life stages. "Preferred" depth, temperature, and salinity ranges would be updated based on the latest EFH Source document for spiny dogfish (NMFS 2007).

8.10.5.3 Delayed Implementation of Commercial Quota Alternatives

Alternative 3A: No action. (No Commercial Quota Until Final Rule Effective)
Under this alternative, the fishery would continue to potentially open the start of the fishing year (May 1) without a commercial quota and continue to operate until the effective date for the final rule for the commercial quota for that fishing year. The daily possession limit from the previous year, however, would be maintained until replaced by the possession limit specified for the new fishing year.

Alternative 3B: Maintain Existing Quota until Effective Date for New Quota
Under this alternative, if the effective date for the commercial quota in a given fishing year falls after May 1, then the commercial quota from the previous year would remain in effect until the effective date for the quota specified for the new fishing year.

8.10.5.4 Commercial Quota Allocation Alternatives

Alternative 4A: No Action. (Maintain Seasonal Allocation of the Commercial Quota)
Under this alternative, the existing scheme, which allocates 51.9% of the annual commercial quota to Period 1 (May 1 – Oct 31) and 42.1% to Period 2 (Nov 1 – Apr 30), would be maintained.

Alternative 4B: Eliminate Allocation of the Commercial Quota.
Under this alternative, a commercial quota would be specified for a given fishing year, but that quota would not be allocated either periodically or geographically.

Alternative 4C: Match the Geographic Allocation of the Commercial Quota under the Commission's Interstate Fishery Management Plan.
Under this alternative, minimizing conflicts resulting from the two allocation schemes would be accomplished by matching the Commission's geographic allocation of the quota in the federal FMP, specifically by dividing the coastwide quota according to the percentages in Table 31 below.

Table 32. Percent allocation of the coastwide annual quota (from Addendum III to the ISFMP).

Northern Region (ME-CT)	**Southern Region**					
	NY	**NJ**	**DE**	**MD**	**VA**	**NC**
58%	2.707%	7.644%	0.896%	5.920%	10.795%	14.036%

8.10.6 Economic Analysis

The economic impacts of the proposed actions are discussed in Section 7.0 of this document. None of the alternatives are associated with direct economic impacts by increasing or maintaining revenue from the dogfish fishery. Additionally, no significant economic impacts are

expected because the alternatives are consistent with the goals of the FMP and are unlikely to result in significant deviation (negatively) from the status quo.

8.10.7 Determination of Significance under E.O. 12866

NMFS Guidelines provide criteria to be used to evaluate whether a proposed action is significant. A significant regulatory action means any regulatory action that is likely to result in a rule that may:

1. *Have an annual effect on the economy of $100 million or more, or adversely effect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities.*

The proposed action will not have an effect on the economy in excess of $100 million. The proposed action is not expected to have any adverse impacts on the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local or tribal governments or communities.

2. *Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.*

The proposed action will not create a serious inconsistency with, or otherwise interfere with, an action taken or planned by another agency. No other agency has indicated that it plans an action that will affect the spiny dogfish fishery in the EEZ.

3. *Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof.*

The proposed action will not materially alter the budgetary impact of entitlements, grants, user fees or loan programs, or the rights and obligations of their participants.

4. *Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.*

The proposed action does not raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866.

8.10.8 Initial Regulatory Flexibility Analysis

The following sections contain analyses of the effect of the proposed action on small entities. Under Section 603(b) of the RFA, each initial regulatory flexibility analysis is required to address:

1. Reasons why the agency is considering the action,
2. The objectives and legal basis for the proposed rule,
3. The kind and number of small entities to which the proposed rule will apply,
4. The projected reporting, record-keeping and other compliance requirements of the proposed rule, and
5. All federal rules that may duplicate, overlap, or conflict with the proposed rule.

8.10.9 Reasons for Considering the Action

The purpose and need for this action is identified in Section 4.1 of this document. This action is needed to improve the efficiency with which the FMP achieves its established management goals and incorporate the best scientific information into the FMP. The overall management goal of the FMP is to conserve spiny dogfish in order to achieve optimum yield from the resource in the western Atlantic Ocean.

8.10.10 Objectives and Legal Basis for the Action

The objective of the proposed action is to improve the efficiency with which the FMP achieves its established management goals and incorporate the best scientific information into the FMP.

8.10.11 Description and Number of Small Entities to Which the Rule Applies

In 2012, there were 2,666 vessels that held a Spiny Dogfish permit. However, not all of those vessels are active participants in either fishery; only 489 vessels landed Spiny Dogfish in 2012. If two or more vessels have identical owners, these vessels should be considered to be part of the same firm, because they may have the same owners. When permit ownership data is considered, in 2012 there were **1,976** fishing firms that held at least one Spiny Dogfish permit. Firms are classified as finfish or shellfish firms based on the activity which they derive the most revenue. Using the $5M cutoff for shellfish firms (NAICS 114112) and the $19M cutoff for finfish firms (NAICS 114111), there are **1,953** directly regulated small entities and **23** directly regulated large entities.

Table 33 describes the number of small entities that have at least 1 Spiny Dogfish permit, their average gross receipts, and their average gross receipts derived from Spiny Dogfish. For each entity, the average gross receipts for the 2010-2012 period are constructed from NMFS dealer reports. On average, for these small entities, Spiny Dogfish is responsible for a small fraction of landings. While all **1,953** directly regulated small entities will be affected by the Amendment 3, many of these small entities do not currently participate in this fishery and would be likely to experience only negligible economic impacts. A description of the small entities that are directly regulated **and** are active in the Spiny Dogfish is included in order to provide more understanding about the small entities that are experience effects of the Amendment 3.

Table 33. Number of small fishing firms, average gross receipts, and average gross receipts derived from Spiny Dogfish.

Revenue Category	Count of Firms	Average Gross Receipts	Average of Dogfish Receipts
.5-1M	118	$711,598	$2,169
<.5M	1639	$87,720	$1,500
1-2M	136	$1,477,752	$883
2-3M	34	$2,514,723	$38
3-4M	15	$3,376,305	$94
4-5M	10	$4,461,217	$119
5+ M	1	c	c
Total	1953		

Table 34 describes the number of small entities that are active in the Spiny Dogfish fishery, their average gross receipts, and their average gross receipts derived from Spiny Dogfish. For each entity, the average gross receipts for the 2010-2012 period are constructed from NMFS dealer reports. The active Spiny Dogfish fishery participants derive a small share of gross receipts from the Spiny Dogfish fishery. There are **488** active fishing firms, of which **482** are small entities and **6** are large entities.

Table 34. Number of active small fishing firms, average gross receipts, and average gross receipts derived from Spiny Dogfish. Only firms that caught Spiny dogfish are included.

Revenue Category	Count of Firms	Average Gross Receipts	Average of Dogfish Receipts
<.5M	410	$151,686	$5,998
.5-1M	44	$724,235	$5,817
1-2M	21	$1,410,646	$5,717
2-3M	3	$2,543,758	$436
3-4M	3	$3,352,480	$471
4-5M	1	c	c
Grand Total	**482**		

8.10.12 Recordkeeping and Reporting Requirements

The proposed action does not introduce any new reporting, recordkeeping, or other compliance requirements.

8.10.13 Duplication, Overlap, or Conflict with Other Federal Rules

The proposed action does not duplicate, overlap or conflict with any other federal rules.

8.10.14 Economic Impacts on Small Entities

Section 7.0 of this document contains the economic analysis of the alternatives that were considered during the specification process.

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11.0 LIST OF AGENCIES AND PERSONS CONSULTED

This document was prepared by the Mid-Atlantic Fishery Management Council in consultation with the National Marine Fisheries Service and the New England Fishery Management Council.

Additional (final) copies of this EA can be obtained via the NMFS GARFO website: http://www.nero.noaa.gov/

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David Stevenson, NMFS NERO, Habitat Division
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In addition, the following organizations/agencies were consulted during the development of the spiny dogfish specifications, either through direct communication/correspondence and/or participation in Council public meetings:

NOAA Fisheries, National Marine Fisheries Service, Northeast Regional Office, Gloucester MA
New England Fishery Management Council, Newburyport, MA
Northeast Fisheries Science Center, Woods Hole, MA
Atlantic States Marine Fisheries Commission

APPENDIX

In the development of the maps that are to be used as reference for spiny dogfish EFH, maps were created that depicted different percentiles of the cumulative geometric mean catch of spiny dogfish in the NEFSC trawl survey. These are provided below (Figures A-1 through A-6). Note that EFH for "juveniles" in the amendment consists of the combined EFH for “neonates” (<26 cm) and "juveniles" (27-35 cm). In the original EFH designation, it is unclear, but likely that the term "juveniles" refers to any spiny dogfish below the size at maturity (80 cm for females and 60 cm for males). The apparent offshore distribution of younger spiny dogfish support separating the designation of EFH for these life stages.

In the figures below, catch data from all available research survey sources are displayed on a single EFH map for each life history stage in order to show data from all data sources combined and to facilitate comparisons between cumulative percentage categories for NEFSC survey data. For each map, three separate color schemes were used to differentiate between the different methods used to determine EFH. Those ten minute squares where the criteria for designation as EFH were not met are uncolored. For the offshore NEFSC trawl survey, the 90^{th} cumulative percentile, which includes all of the red, orange yellow, and light green ten minute squares are considered EFH and the dark green TNMS are considered to be below the EFH. The occurrence of spiny dogfish in >10% of ten minute squares for state and other nearshore surveys is displayed in blue, while the sampling extent for these surveys is indicated with crosshatching. Because of the differences in methodology, the visualization of EFH should be interpreted with caution. It is possible that primarily offshore distribution of smaller dogfish which is apparent in the mapped NEFSC trawl catches of recruits and juveniles is more representative than the nearshore ten minute squares that satisfy the >10% capture rate criteria.

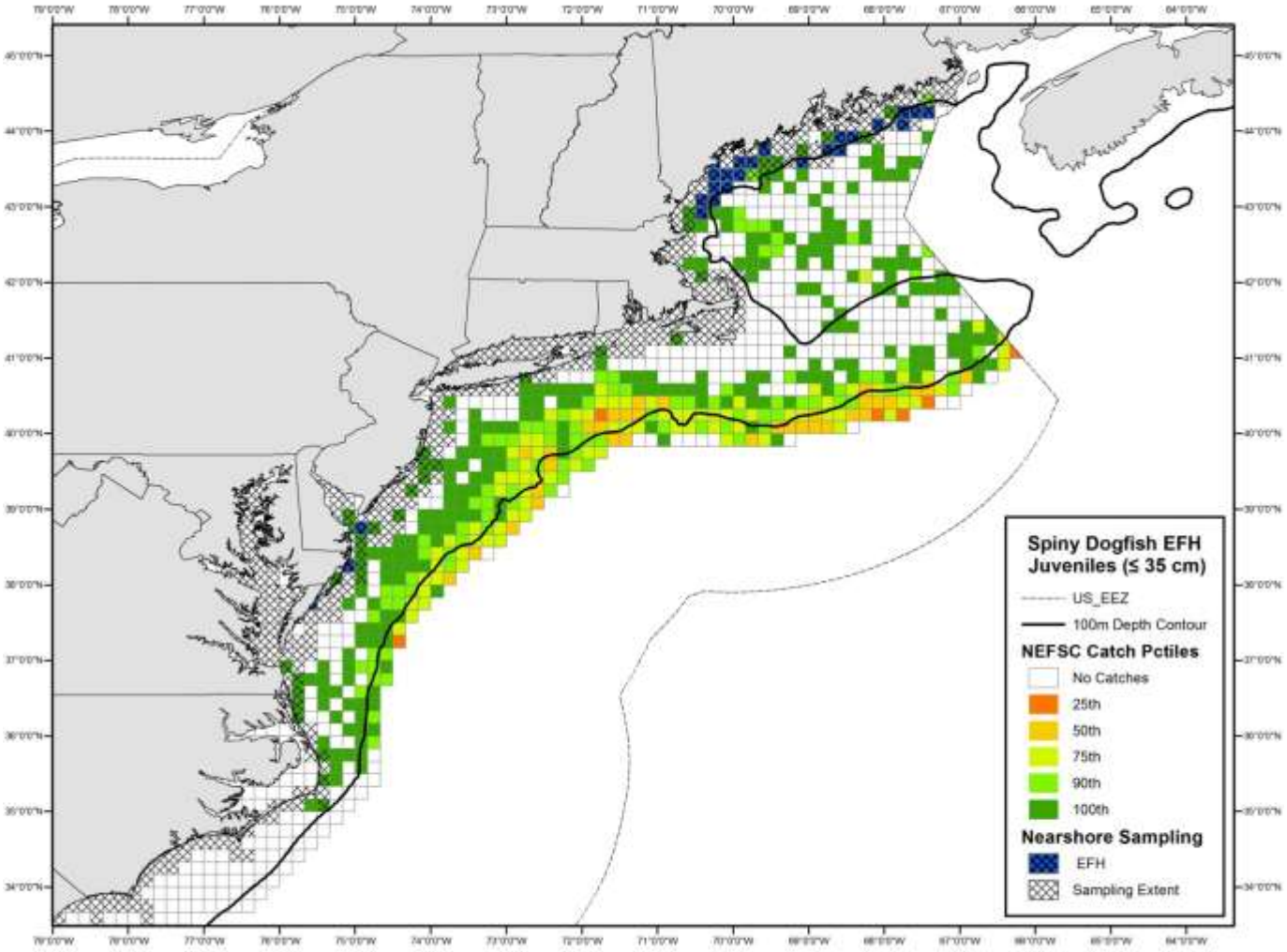

Figure A - 1. EFH for spiny dogfish juveniles (length ≤ 26 cm) showing 50th through 100th percentiles of the ranked ten minute squares where neonate spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. Under Alternative 2B, the 90th percentile, which includes all of the red, orange yellow, and light green TNMS are included and the dark green TNMS are considered to be below the EFH threshold.

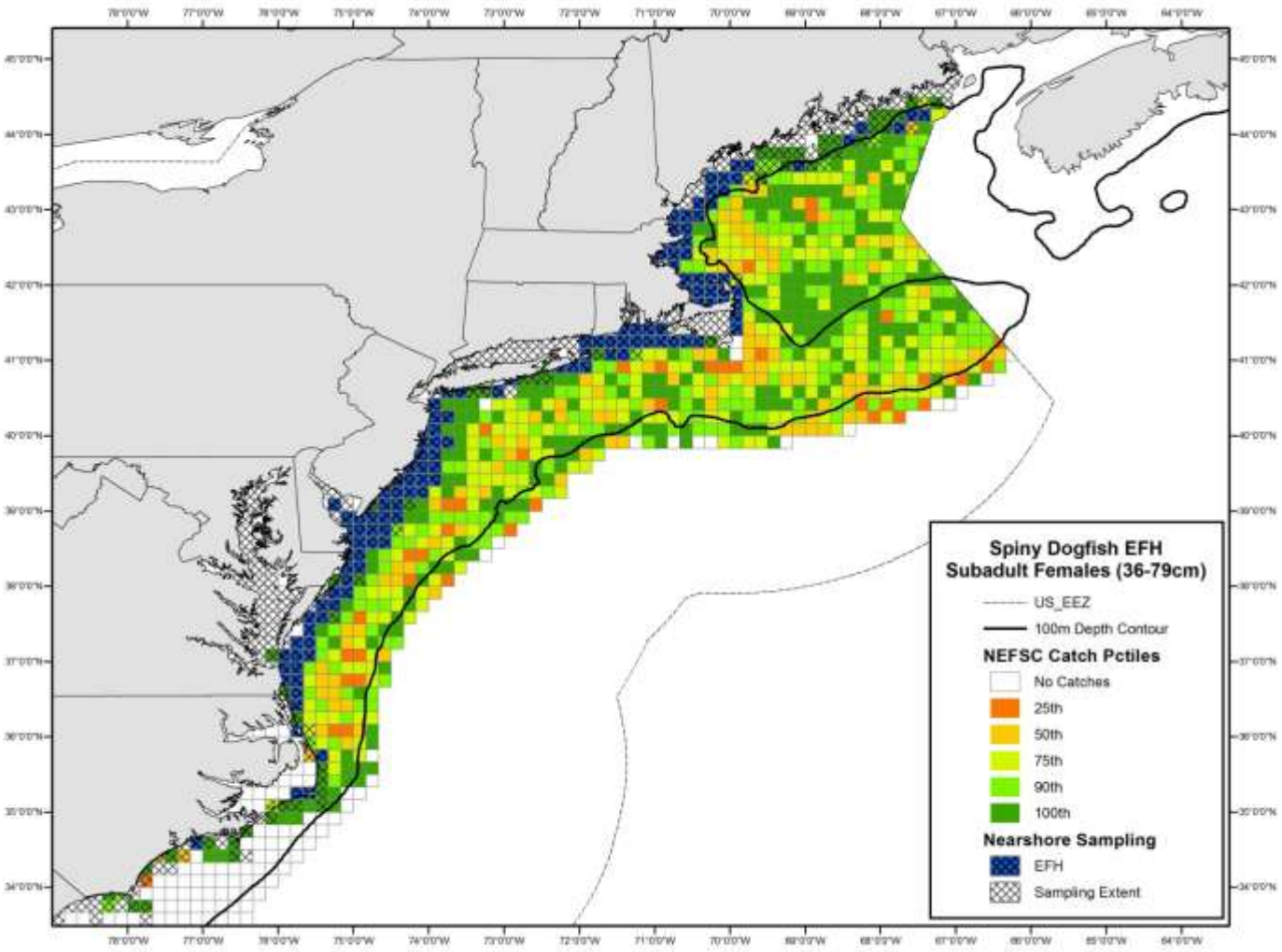

Figure A - 2. EFH for female spiny dogfish sub-adults (length 36 – 79 cm) showing 50th to 100th percentiles of the ranked ten minute squares where female sub-adult spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. Under Alternative 2B, the 90th percentile, which includes all of the red, orange yellow, and light green TNMS are included and the dark green TNMS are considered to be below the EFH threshold.

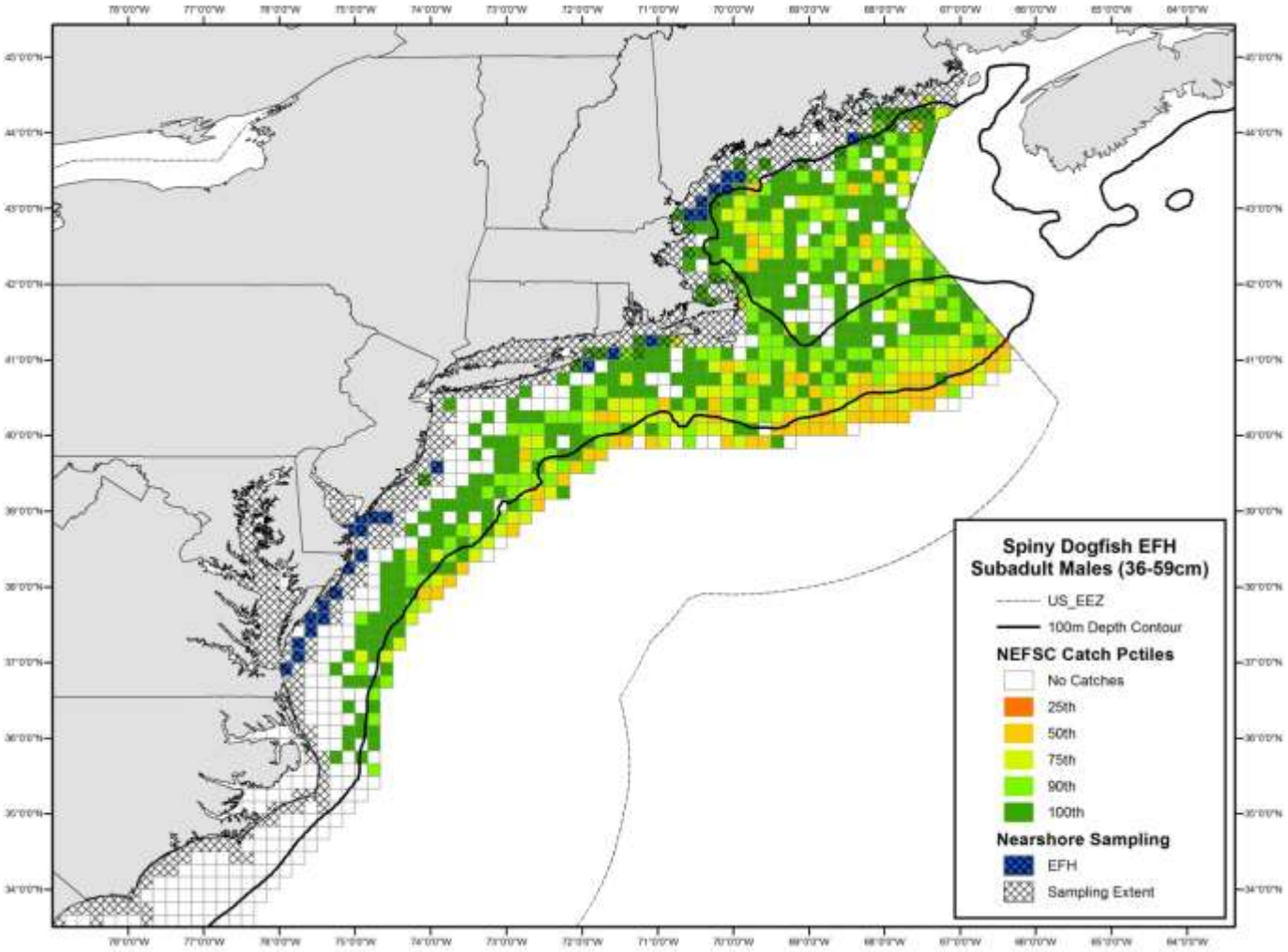

Figure A - 3. EFH for male spiny dogfish sub-adults (length 36-59 cm) showing 50th to 100th percentiles of the ranked ten minute squares where male sub-adult spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. Under Alternative 2B, the 90th percentile, which includes all of the red, orange yellow, and light green TNMS are included and the dark green TNMS are considered to be below the EFH threshold.

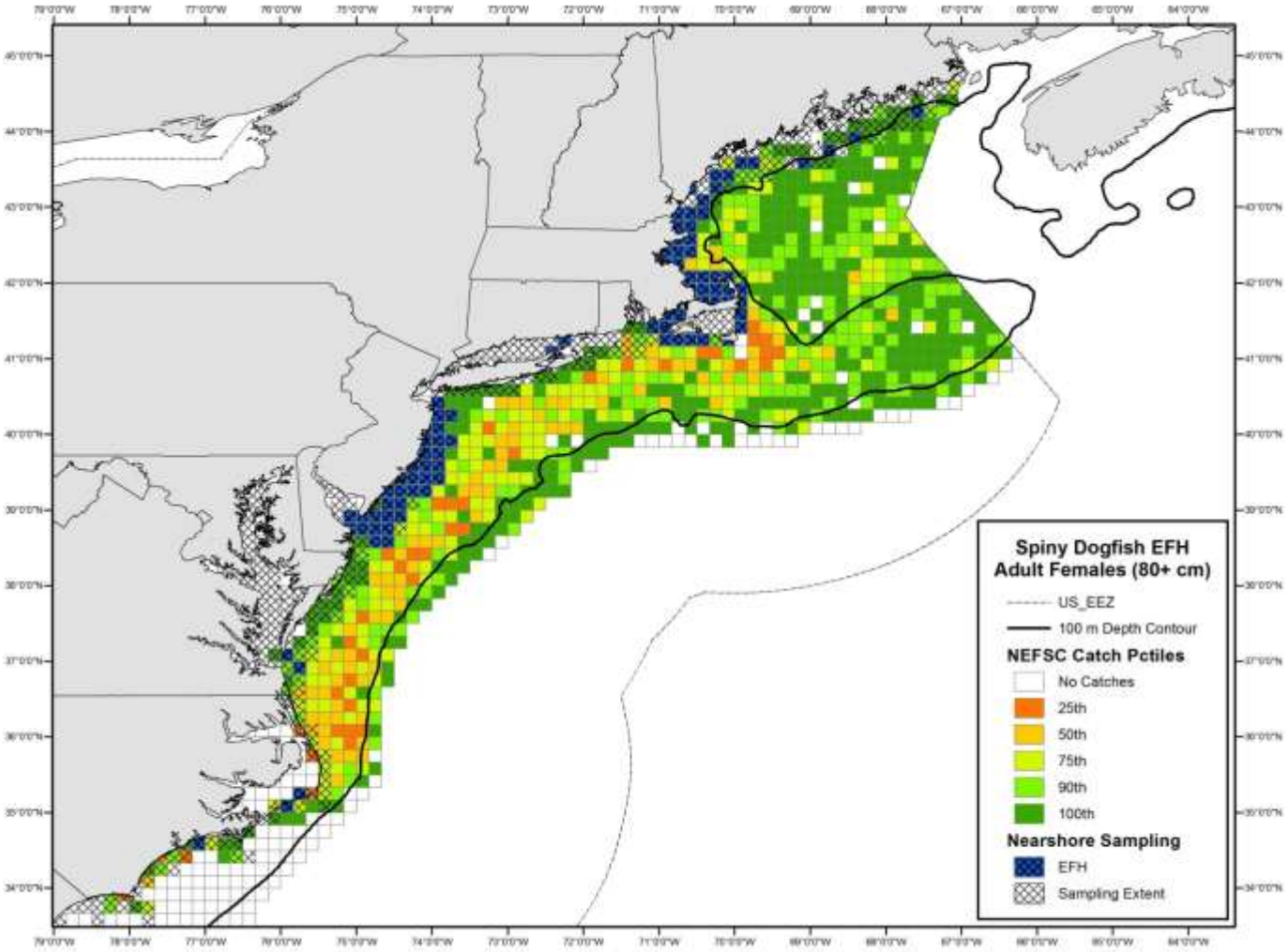

Figure A - 4. EFH for female spiny dogfish adults (length 80+ cm) showing 50th to 100th percentiles of the ranked ten minute squares where female adult spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. Under Alternative 2B, the 90th percentile, which includes all of the red, orange yellow, and light green TNMS are included and the dark green TNMS are considered to be below the EFH threshold.

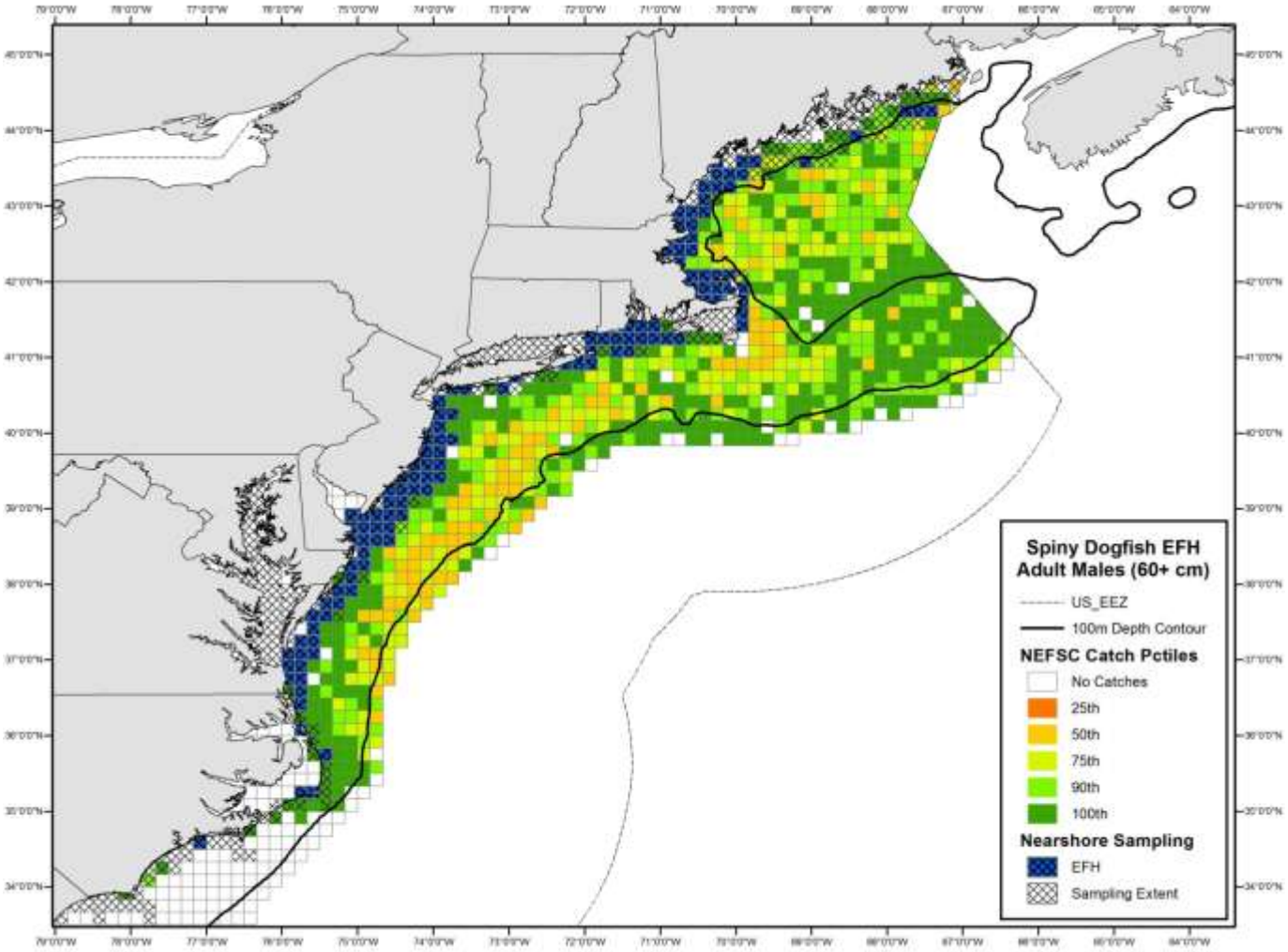

Figure A - 5. EFH for male spiny dogfish adults (length 60+ cm) showing 50th to 100th percentiles of the ranked ten minute squares where male adult spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011 Under Alternative 2B, the 90th percentile, which includes all of the red, orange yellow, and light green TNMS are included and the dark green TNMS are considered to be below the EFH threshold.